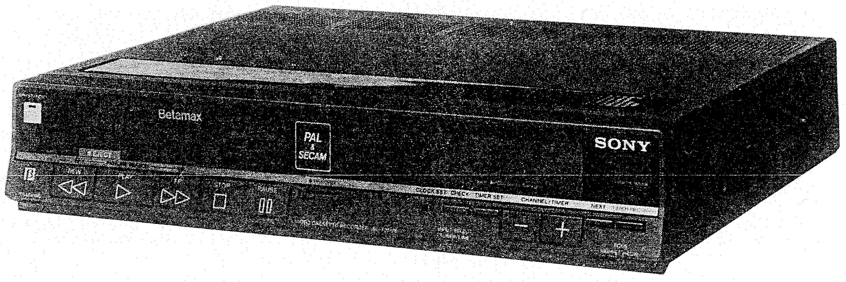
SL-T25ME
RMT-234

SERVICE MANUAL



November, 1984

711B2 CHASSIS

This manual contains the adjustment method.

SPECIFICATIONS

System

Video recording system	Rotary two-head helical scanning
Video signal	CCIR standards, PAL and SECAM colour
Aerial input	75-ohm, asymmetrical aerial socket
Channel coverage	VHF : Western European channels E2-E12 UHF : Western European channels E21-E68 (Up to 12 programmes can be preset.)
RF output signal	UHF channels E30 to E39 (variable) 75 ohms, unbalanced

Video

Input	VIDEO IN : BNC connector 1.0 V $^{+1.0}_{-0.5}$ V (p-p) 75 ohms, unbalanced, sync negative
Output	VIDEO OUT : BNC connector 1.0 V (p-p) ±0.1 V (p-p) 75 ohms, unbalanced, sync negative
Horizontal resolution	260 lines
Signal-to-noise ratio	Colour : Better than 40 dB B/W : Better than 43 dB

Audio

Input	AUDIO IN : phono jack 47 kilohms, −10 dBs (0 dBs = 0.775 V rms)
Output	AUDIO OUT : phono jack Load impedance less than 10 kilohms −10 dBs with 47 kilohms load, unbalanced
Frequency response	50 Hz to 10 kHz
Signal-to-noise ratio	40 dB
Audio distortion	Less than 4 % at 400 Hz

Tape transport

Tape speed	18.73 mm/sec.
Maximum recording time	2 hours 10 min. (with Sony L-500 cassette) 3 hours 15 min. (with L-750)
Fast forward/rewind time	Within 5 min. (with L-500)

Timer

Clock	Crystal lock
Time indication	24-hour cycle
Timer setting	Only for recording 1 event/3 weeks, adjustable for any day or for all 7 days of the week

— Continued on next page —

Beta
B VIDEO CASSETTE RECORDER

SONY®

MICROFILM

Consumer VIDEO

General

Power requirements	110 - 127 V or 220 - 240 V AC ± 10 % adjustable, 50/60 Hz
Power consumption	38 W
Storage temperature	-20° C to + 65° C (-4° F to + 149° F)
Operating temperature	5° C to 40° C (41° F to 104° F)
Dimensions	Approx. 430 × 80 × 382 mm (w/h/d) (17 × 3¼ × 15⅛ inches) including projecting parts and controls
Weight	Approx. 8.2 kg (18 lbs 1 oz) net

Accessories supplied

75-ohm coaxial cable for recorder to TV connection (1)

Remote Commander RMT-234 with two IEC designation R6 batteries (1)

RF channel adjustment screwdriver (1)

Design and specifications subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

TABLE OF CONTENTS

Section *Title* *Page*

1. GENERAL

1-1. Precautions 4
1-2. Location and Function of Controls. 5
1-3. Adjusting the TV 8
1-4. TV Station Programming. 9
1-5. Clock Setting 10
1-6. TV Programme Recording 11
1-7. Timer-Activated Recording 13
1-8. Quick Timer Recording 14

2. DISASSEMBLY

2-1. Disassembly of Cabinet. 15
2-2. Removal of the RP-20 Board 16
2-3. Removal of the TA-22 Board 17
2-4. Removal of the YC-31 Board 17
2-5. Removal of the Timer Block. 18
2-6. Removal of the FU-25 Board 18
2-7. Removal of the Power Block 19
2-8. Removal of the FL Cassette Compartment Assembly. 20
2-9. Removal of the Reel Block Assembly 20
2-10. Internal View 21

3. DIAGRAMS

3-1. Circuit Boards Location 22
3-2. Overall Block Diagram 23
3-3. Video Block Diagram. 26
3-4. System Control Block Diagram 29
3-5. System Control Interface 31
3-6. Servo Block Diagram 37
3-7. Capstan Phase System Timing Chart (REC) . . . 39
3-8. Capstan Phase System Timing Chart (PB) 39
3-9. Capstan Speed System Timing Chart 40
3-10. Drum Phase System Timing Chart 40
3-11. Drum Speed System Timing Chart 41
3-12. PG Signal Timing Chart 41
3-13. Audio Level Diagram (REC). 42
3-14. Audio Level Diagram (PB) 42
3-15. Audio Block Diagram. 43
3-16. Tuner Block Diagram. 45
3-17. Timer Block Diagram. 47
3-18. Power Block Diagram. 49

4. SCHEMATIC DIAGRAM AND PRINTED WIRING BOARDS

4-1. Flame Schematic Diagram 51
4-2. YC-31, RP-20 Boards. 55
4-3. SS-34, RD-20, RD-21, LM-8, FU-25, N, CAPSTAN MOTOR, R. STATOR Boards 63
4-4. TA-22, MT-10, TM-57, TM-58 Boards 71
4-5. PS-67, PS-76, VS-4 Boards. 79
4-6. Semiconductors. 83
4-7. UHF and VHF Tuner Schematic Diagram 85

5. EXPLODED VIEWS

5-1. Front Panel and Cabinet Assemblies 86
5-2. Tuner, Timer and Power Assemblies 87
5-3. Front Loading Assembly. 88
5-4. Chassis Assembly 1 89
5-5. Chassis Assembly 2 90
5-6. Drum Assembly 91
5-7. Reel Block Assembly 92
5-8. Hardware List 93

6. ELECTRICAL PARTS LIST 94

7. ADJUSTMENT 112

REMOTE COMMANDER RMT-234 163

SECTION 1
GENERAL

1-1. PRECAUTIONS

On safety
- Before operating the unit, make sure that the operating voltage of your unit is identical with that of your local power supply.
- Should any solid object or liquid fall into the cabinet, turn off the unit and have it checked by qualified personnel before operating it any further.
- To disconnect the mains lead (ac power cord), pull it out by the plug. Never pull the lead itself.
- The unit is not disconnected from the mains (ac power source) as long as it is connected to the mains outlet, even if the unit itself has been turned off.

On installation
- Allow adequate air circulation to prevent internal heat build-up. Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation grille.
- Do not install the unit near heat sources such as radiators or air ducts or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- The unit is designed for operation in a horizontal position. Do not install it in an inclined position.
- Keep the unit and cassette tapes away from equipment with strong magnets, such as a microwave oven, large loudspeakers, etc.

On operation
- When the unit is not to be used for a long period, turn the unit off to conserve energy and to extend the useful life of your unit.
- Remove and store video cassettes after recording or playback. Always store the cassette in its case to keep the tape away from dust.

On cleaning
Clean the cabinet, panel and controls with a dry soft cloth. Do not use a moistened cloth or any type of solvent, such as alcohol or benzine, which might damage the finish.

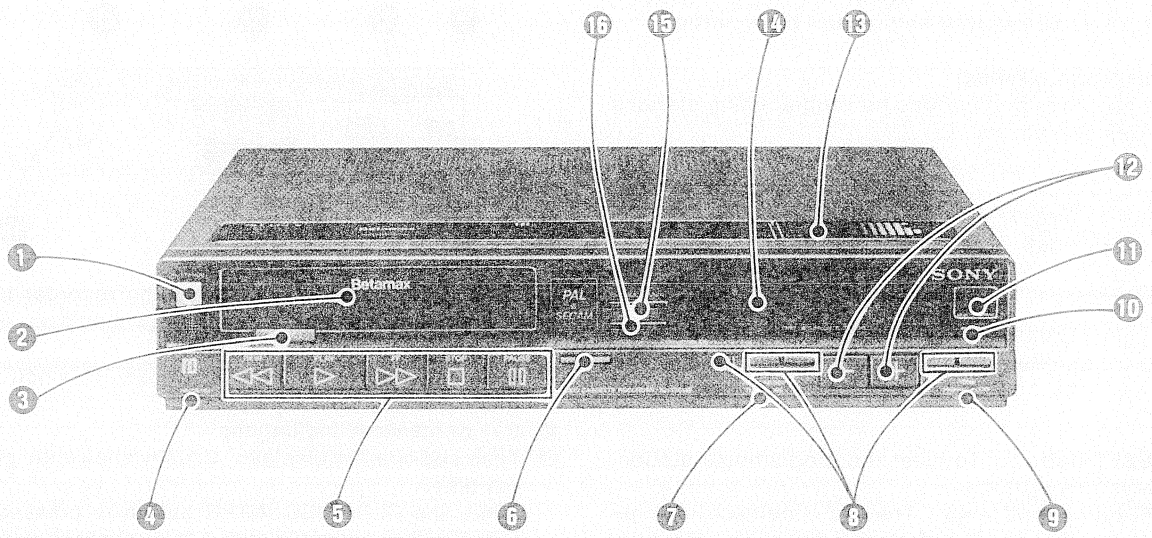
On repacking
Do not throw away the carton and packing materials. They make an ideal container in which to transport the unit. When shipping the unit to another location, repack it as illustrated on the carton.

On colour broadcasting systems
This unit is designed to receive, record and play back programmes based on the PAL and SECAM colour systems.
- Tapes recorded with the French SECAM colour system can be played back on this unit but it is not possible to receive French TV broadcasts with this unit.

If you have any questions about this unit, contact your Sony dealer.

1-2. LOCATION AND FUNCTION OF CONTROLS

Front



① ON/STANDBY button and indicator
Press to turn on the unit. The indicator will light up. Press again to turn it off.
The timer section will continue to operate and the time will be displayed even if the ON/STANDBY button is off.

② Cassette compartment
Insert a cassette after turning on the recorder. The ▭ indication appears on the display window when a cassette is inside.

③ ⏏ EJECT button
Press to remove the cassette. This button does not function when the recorder is turned off.

④ TRACKING control
If streaks or snow appear during the playback of a tape recorded on another recorder, turn this knob to obtain the best possible picture.

⑤ Function buttons

◀◀ REW button: Press to rewind the tape. Also used for the reverse picture search, skip scan and auto play operation.

▶ PLAY button: Press to play the tape back. Also used for auto play operation.

▶▶ FF button: Press to advance the tape rapidly. Also used for the forward picture search and skip scan operation.

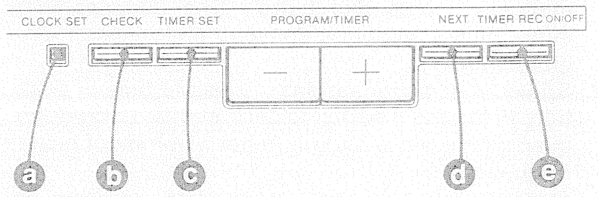
■ STOP button: Press to stop the tape.

❚❚ PAUSE button: Press to stop the tape for a moment during recording or playback. A still picture will be seen during playback. Press again to release the pause mode.

⑥ ● RECORD button
Press to start recording.

⑦ INPUT SELECT button
Press to select the programme to be recorded.
LINE: for recording signals connected to the VIDEO IN and AUDIO IN jacks.
TUNER: for recording TV programmes.

⑧ Buttons for clock and timer setting



ⓐ **CLOCK SET button**: Press to initiate clock setting.
ⓑ **CHECK button**: Press to check timer settings.
ⓒ **TIMER SET button**: Press to initiate setting of timer recording.
ⓓ **NEXT button**: Press to advance to the next item to be set during clock or timer setting.
ⓔ **TIMER REC ON/OFF button**: Press to activate timer recording. Press it again to deactivate timer recording or quick timer recording in timer standby mode or while recording.

⑨ TONE selector
Normally, set to HIGH. If the high frequencies of playback sound seem exaggerated, set to LOW.

⑩ QUICK TIMER button
Press to set the recording duration up to 4 hours in units of 30 minutes.

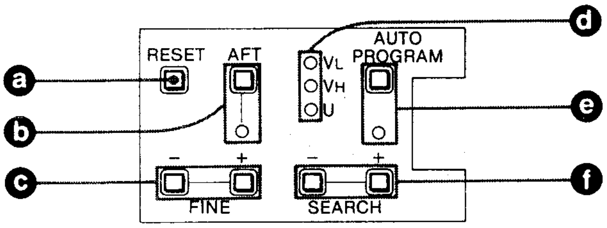
⑪ REMOTE SENSOR
Detects the remote control signal transmitted from the supplied Remote Commander.

⑫ PROGRAM/TIMER +/– button

Press + to advance or – to reverse the programme numbers. Also used for clock setting and timer setting.

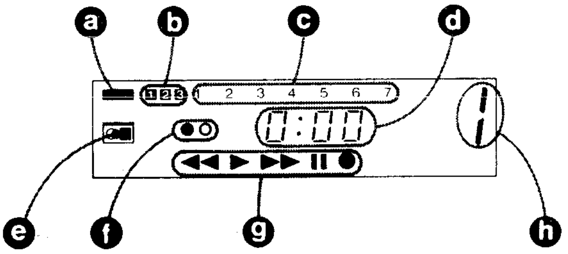
⑬ Tuning compartment

All the switches and buttons for programming stations are in this compartment.



- ⓐ **RESET button:** To clear the programmed station, press this button.
- ⓑ **AFT button and lamp:** The AFT circuit activates automatically after the stations are tuned and memorized with automatic and manual programming. The AFT lamp will illuminate. If you wish to restore the AFT on the channel which has been fine-tuned manually with the FINE buttons, press the AFT button.
- ⓒ **FINE + and – buttons:** Press to fine tune the station.
- ⓓ **Tuning indicator:** Indicates the tuning band.
- ⓔ **AUTO PROGRAM (automatic programming) button and lamp:** To preset the receivable stations automatically, press this button. The corresponding lamp blinks during automatic and manual programming.
- ⓕ **SEARCH + and – buttons:** Press to tune in a station. Press the – button to get a station of lower frequency and the + button to get a station of higher frequency.

⑭ Display window



- ⓐ **TIMER REC indication:** Shows the recorder is in the timer standby mode. It remains displayed until the timer recording is finished.
- ⓑ **Week indications:** Show the week in which the timer recording will take place.
- ⓒ **Day of the week indications**
- ⓓ **Time and counter display:** Usually shows the present time.
  When the CLOCK/COUNTER button is pressed to COUNTER, the display shows the counter number.
- ⓔ **Cassette-inside indication:** Shows a cassette is inserted.
- ⓕ **Turn-on and turn-off setting indications:** The "●" mark shows the display is the turn-on time of the timer recording and the "O" mark shows the turn-off time.
- ⓖ **Tape operation mode indications:** Show the engaged tape operation mode: ◀◀ (rewind), ▶ (playback), ▶▶ (fast-forward), ❚❚ (pause) or ● (recording).
- ⓗ **Programme number:** Shows the programme number selected with the PROGRAM/TIMER + and – buttons.
  When the INPUT SELECT button is pressed to LINE to record signals from the VIDEO IN and AUDIO IN jacks, the indication will change to "AU".

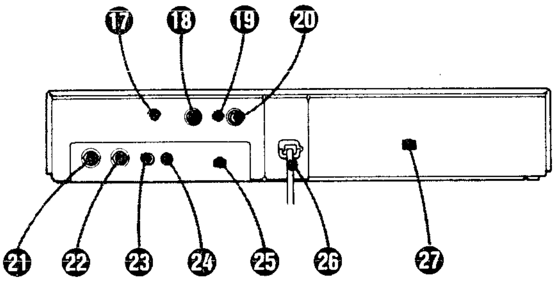
⑮ CLOCK/COUNTER button

Press to set the display to the tape counter. To reset to clock, press it again.

⑯ CLEAR/RESET button

Press to set the tape counter reading to "0000" when the tape counter is displayed. Also used for changing the timer setting and erasing the memory of the timer setting.

Rear



⑰ RF CHANNEL screw
If there is interference on the factory-preset channel for RF output and the signal of this recorder cannot be displayed clearly on the TV screen, adjust this screw with the supplied screwdriver.

⑱ AERIAL OUT socket
Connect the aerial input of the TV receiver using the supplied cable.

⑲ DX/LOCAL switch
Normally set this switch to DX. If the TV signal is very strong, set the switch to LOCAL.

⑳ AERIAL IN socket
Connect the aerial cable.

㉑ VIDEO OUT jack (BNC type)
Connect to the video input of another video cassette recorder or a video monitor.

㉒ VIDEO IN jack (BNC type)
Connect to the video output of a camera, another video cassette recorder, etc.

㉓ AUDIO OUT jack (phono type)
Connect to the audio input of a video monitor or video cassette recorder.

㉔ AUDIO IN jack (phono type)
Connect to the audio output of a camera or another video cassette recorder.

㉕ TEST SIGNAL switch
Set to ON to obtain the test pattern for adjusting the TV so that it can receive the signal from the recorder.

㉖ AC mains lead

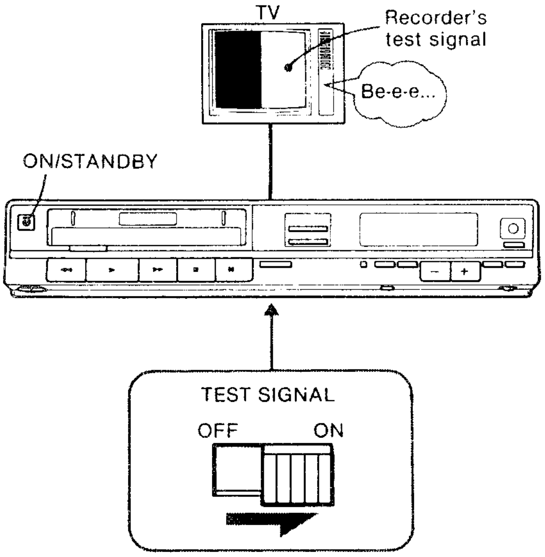
㉗ VOLTAGE SELECTOR
Set to 110 - 127 V or 220 - 240 V according to your local power line voltage.

1-3. ADJUSTING THE TV

One of the television programme positions must be adjusted to receive the signal from the recorder.
Note that the adjustment is not necessary, however, when the recorder is connected to the video/audio inputs on the TV receiver/monitor.

1 After making the connections, press the ON/STANDBY button.
2 Make sure that the recorder is in the stop mode.
3 Set the TEST SIGNAL switch located at the rear of the recorder to ON. The test signal is transmitted on a channel between UHF channels E30 and E39.
4 Turn on the TV and select a programme position which is not being used to receive a TV station. Tune the channel until you see a clear black and white pattern on the TV screen and you hear a continuous tone. This is the recorder's test signal.

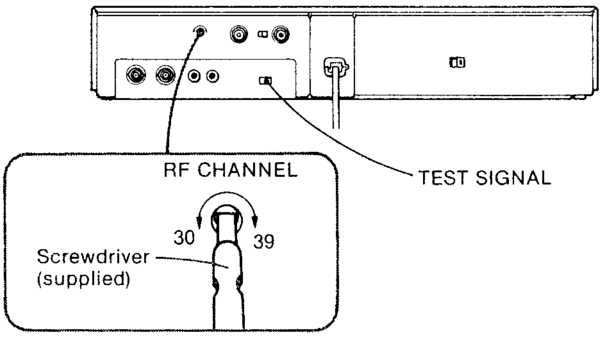
—If you are not sure how to adjust your TV, please refer to the TV's instruction manual or consult your dealer.



Whenever you use the video recorder, you should set the TV to the programme position selected in this adjustment.

If the test picture is free of disturbance, the TV adjustment is complete. Set the TEST SIGNAL switch to OFF.

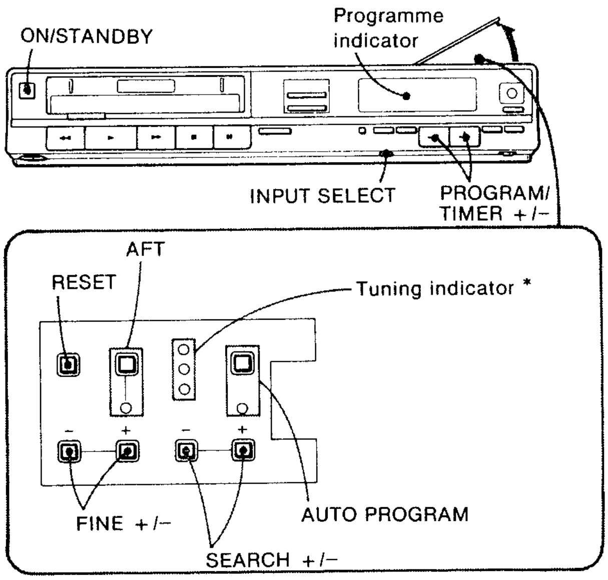
If the test picture is not free of disturbance
1 Reset the TEST SIGNAL switch to OFF.
2 Adjust the channel of the TV to a channel between UHF channels E30 and E39 with the tuning control or the fine tuning control on the TV, so that the TV screen shows no picture and so that a steady rustling sound or no sound is heard.
3 Set the TEST SIGNAL switch to ON again.
4 Slowly turn the RF CHANNEL screw on the back of the recorder with the supplied screwdriver, until you see an undistorted test pattern on the TV screen.
5 Now the TV adjustment is complete. Reset the TEST SIGNAL switch to OFF.



1-4. TV STATION PROGRAMMING

Automatic and manual programming are available. Automatic programming automatically presets receivable stations from the lowest frequency to the highest. Manual programming is useful for presetting selected stations in any desired sequence.

To start programming, turn on the recorder by pressing the ON/STANDBY button and set the INPUT SELECT button to TUNER.



AUTOMATIC PROGRAMMING

Press the AUTO PROGRAM button. Up to 12 receivable stations will be preset one by one from programme position 1. When no more stations can be located, programme number "1" will light on the programme indicator and automatic programming will stop.

MANUAL PROGRAMMING

1 Press the + or − PROGRAM/TIMER button to select the programme position.
   + for a higher-numbered programme position
   − for a lower-numbered programme position

2 Press the + SEARCH button to locate a station with higher frequency and the − SEARCH button to locate a station with lower frequency.
   When a station has been received, the search will stop. Press the + or − SEARCH button again, until the desired station is received.

Repeat these steps for all desired stations.

FINE TUNING OF A WEAK STATION

If the picture on a particular programme position is not acceptable, keep the + or − FINE button pressed until the picture becomes clearer. When either of the FINE buttons is pressed, the AFT of the selected station is deactivated and the AFT lamp goes off. To view this particular station, keep the AFT deactivated. (Do not press the AFT button.)
When other memorized stations are selected, the AFT automatically activates.

ELIMINATING NOISE ON UNUSED PROGRAMME POSITIONS

Simply press the RESET button. The annoying noise will be eliminated.

***Tuning indicator**
The tuning indicator lights to show the current tuning band.
V_L: E2 - E4 channels
V_H: E5 - E12 channels
U: E21 - E68 channels

1-5. CLOCK SETTING

When you connect the mains lead to a mains outlet, the clock indicates "0 : 00" with the two dots blinking.

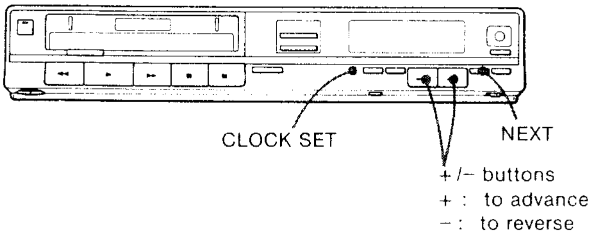
Example : To set the clock to 7 : 35 p.m. (19 : 35) on Tuesday *

***Time indication**

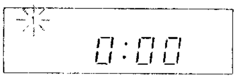
AM				PM					
12 : 00 (midnight)	1 : 00		11 : 00	12 : 00 (noon)	1 : 00	2 : 00		10 : 00	11 : 00
↓ 0:00	↓ 1:00		↓ 11:00	↓ 12:00	↓ 13:00	↓ 14:00		↓ 22:00	↓ 23:00

Day indication

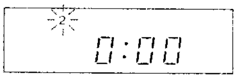
Mo (Monday)	Tu (Tuesday)	We (Wednes-day)	Th (Thursday)	Fr (Friday)	Sa (Saturday)	Su (Sunday)
↓ 1	↓ 2	↓ 3	↓ 4	↓ 5	↓ 6	↓ 7



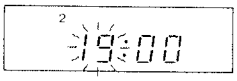
1 Press CLOCK SET.



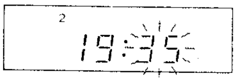
2 Set the day by pressing + or –.



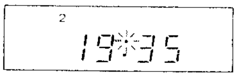
3 Press NEXT and set the hour by pressing + or – .



4 Press NEXT and set the minute by pressing + or – .



5 With an announced time signal, press NEXT.
The clock now starts operating, showing the correct time.



The dots of the colon alternately blink every 30 seconds.

NEXT button

Each time the NEXT button is pressed, the item to be set blinks to let you know the setting order.

+/– buttons

The + and – PROGRAM/TIMER buttons can be pressed in two ways.

When you hold a button down, the digits will advance continuously until the button is released.

When you press and immediately release a button, the digits will advance by one.

To change the actual clock setting

Press the CLOCK SET button and repeat the clock setting procedure from step 1.

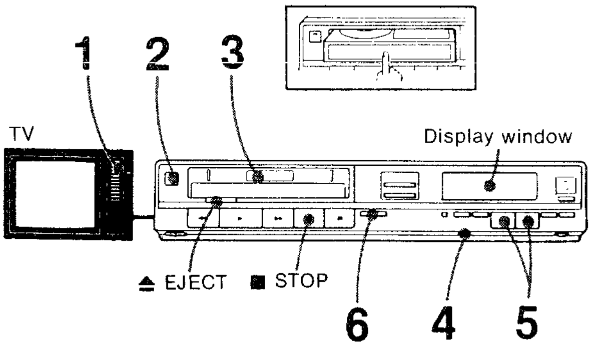
Note

If you have pressed the CLOCK SET button inadvertently, press the NEXT button enough times until the dots of the colon blink.

When power has been interrupted, the time indication reverts to "0 : 00", showing that the clock must be reset.

1-6. TV PROGRAMME RECORDING

Numbers in the illustration show the sequence of operation.



1 Turn on the TV and select the programme position for the recorder.
2 Press the ON/STANDBY button. The indicator on the button will light up.
3 Insert the cassette with the round window to the left. The ▣ indication will appear on the display window.
●Do not use force when inserting the cassette into the compartment.
4 Press the INPUT SELECT button (TUNER) so that a programme number appears on the display window.
5 Select the programme to be recorded with the +/− PROGRAM/TIMER buttons.
+ for higher numbered programmes, and − for lower numbered programmes.
6 Press the ● RECORD button. The ● indication will appear on the display window and recording will begin.
● If the inserted cassette does not have the safety tab, or if the tape is at its end, the cassette will be automatically ejected.

To stop recording, press the ■STOP button.

To eject the cassette, press the ≜ EJECT button after stopping the recording.

To view another TV programme while recording, simply select the programme you want to view with the TV's programme selector.

When the tape reaches the end during recording, it will be automatically rewound.

Note
The recorder can be automatically turned on by inserting a cassette without pressing the ON/STANDBY button.

CAUTION
Television programmes, films, video tapes and other materials may be copyrighted.
Unauthorized recording of such material may be contrary to the provision of the copyright laws.

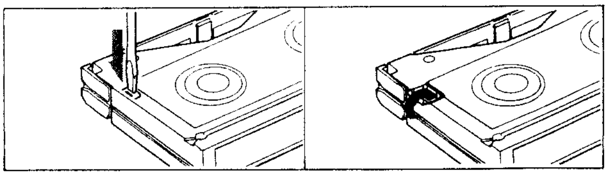
TO STOP RECORDING MOMENTARILY

Press the ❚❚ button. The ❚❚ indicator will appear on the display window. The TV programme can be seen on the TV, but the picture will not be recorded.
To resume recording, press the ❚❚ button again.
To protect the video heads and the tape, the pause mode will be automatically released after about 8 minutes and recording will stop.

TO KEEP A RECORDED PROGRAMME FROM BEING ACCIDENTALLY ERASED

When a new recording is made on a previously recorded cassette, the previous recording will be automatically erased.

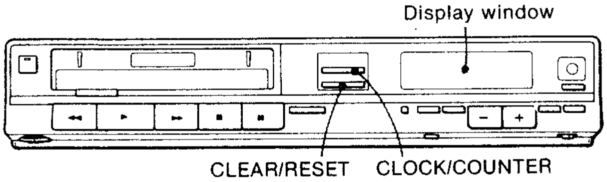
To avoid erasing a recording	To re-record on a cassette which has had the safety tab removed
Break off the safety tab using a screwdriver or similar object.	Cover the slot with a piece of plastic tape.



If you activate the ● RECORD button or the TIMER REC ON/OFF button with a cassette with its safety tab removed inserted, the cassette will be automatically ejected.

TO INDEX A RECORDED PROGRAMME USING THE TAPE COUNTER

Turn on the recorder and press the CLOCK/COUNTER button to display the counter reading in the display window.
To return the display to the present time, press the CLOCK/COUNTER button again.



Before starting recording or playback, press the CLEAR/RESET button to set the counter to "0000".
By noting the counter reading at the desired point, you can easily find that point later by referring to the counter.

Notes

- The counter reading is automatically reset to zero when a cassette is newly inserted.
- While the recorder is off, the display shows the present time, regardless of the CLOCK/COUNTER button setting.
- The counter reading will be retained in the memory even after the recorder is turned off, as long as the cassette is in the cassette compartment.
- The tape counter does not operate when a blank, unrecorded tape is played.

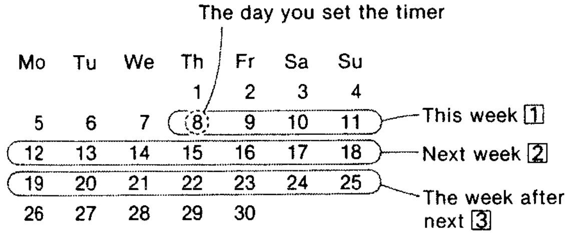
AUTOMATIC STOP

When the tape counter is displayed, rewinding stops at the tape counter's "0000" position. To rewind the tape further, press the ◀◀ button again.
When the current time is displayed, rewinding stops at the beginning of the tape.

1-7. TIMER-ACTIVATED RECORDING

Using the built-in timer, you can make one recording any day or every day, either this week, next week or the week after next.

Possible days for recording


The day you set the timer
This week $\boxed{1}$
Next week $\boxed{2}$
The week after next $\boxed{3}$

Mo	Tu	We	Th	Fr	Sa	Su
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

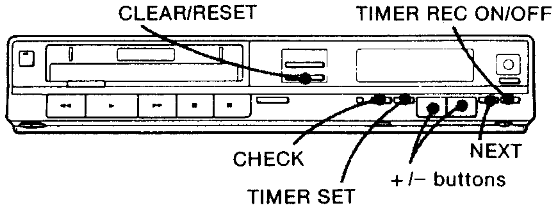
Check before setting the timer

- Is the clock set to the correct day and correct time? Timer setting can only be made after the clock has been set.
- Is a cassette inserted in the recorder?
- Is the cassette long enough to record the programmes?
- Does the cassette have a safety tab on the bottom?

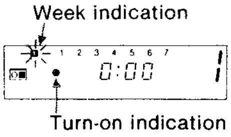
Note: The timer cannot be set during recording or playback.

TO SET THE TIMER

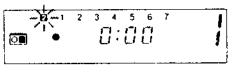
Example: To record a PROGRAM 2 broadcast from 9 : 00 AM to 11 : 25 AM on Friday next week.


CLEAR/RESET
TIMER REC ON/OFF
CHECK
NEXT
+/– buttons
TIMER SET

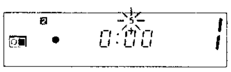
1 Press TIMER SET.
(If the recorder is off, it will be turned on automatically.)


Week indication
1 2 3 4 5 6 7
0:00
1
Turn-on indication

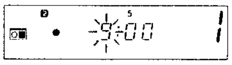
2 Set the week by pressing + or –.
Week indication changes: $\boxed{1}\rightarrow\boxed{2}\rightarrow\boxed{3}$


1 2 3 4 5 6 7
0:00
1

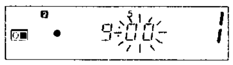
3 Press NEXT and set the turn-on day by pressing + or –.
Day indication changes: 1234567(everyday)→1→2→...7



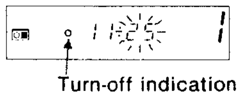
4 Press NEXT and set the turn-on hour by pressing + or –.



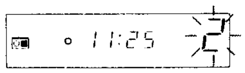
5 Press NEXT and set the minute by pressing + or –.
(To set to 00 minutes, there is no need to press + or –.)



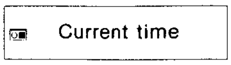
6 Press NEXT and set the turn-off hour and minute with + or – as in turn-on time setting.


11:25
1
Turn-off indication

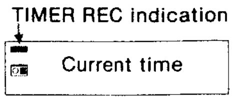
7 Press NEXT and select the programme to be recorded with + or –.
To record the signals from the equipment connected to the VIDEO IN and AUDIO IN jacks, press INPUT SELECT so that "AU" indication appears.



8 Press NEXT.
The display reverts to the current time.


Current time

9 Press TIMER REC ON/OFF.
The TIMER REC indication appears and the recorder is turned off.


TIMER REC indication
Current time

At the preset turn-on time, recording will start automatically and will stop at the preset turn-off time.

Note
If the inserted cassette is at its end or does not have the safety tab, the cassette will be automatically ejected when the TIMER REC ON/OFF button is pressed.

ONCE THE TIMER REC INDICATION HAS LIT UP, NO FUNCTION OF THE RECORDER CAN BE ACTIVATED, except for checking the timer setting.
To operate the recorder after setting the timer for recording, press the TIMER REC ON/OFF button so that the TIMER REC indication goes off. To reactivate the timer recording standby mode, be sure to press the TIMER REC ON/OFF button again.

WHILE SETTING THE TIMER

To change the preset item
Press the CLEAR/RESET button and repeat the timer setting procedure from step 2.

To record to the end of the tape
Set the turn-off time to a time after the tape will reach its end.

BEFORE OR DURING TIMER RECORDING

To check the timer settings
Press the CHECK button. Each time the CHECK button is pressed, the display will change to the preset turn-on time, the turn-off time, then the current time.
During actual timer recording, only the turn-off time can be checked.

To change the settings

1 Press the TIMER REC ON/OFF button so that the TIMER REC indication goes off.
2 Press the CHECK button.
3 Press the CLEAR/RESET button.
4 Repeat the timer setting procedure from step 2.

To erase the timer setting

1 Press the TIMER REC ON/OFF button so that the TIMER REC indication goes off.
2 Press the CHECK button.
3 Press the CLEAR/RESET button.
4 Press the TIMER SET button. The setting will be erased from the memory.

Note: When the TIMER REC indication is displayed, the timer setting cannot be erased.

If the tape reaches the end during timer recording
The recording will stop and the tape will be rewound to the beginning. Then after about a second, the recorder will be turned off.

To stop the on-going timer recording
Press the TIMER REC ON/OFF button so that the TIMER REC indication goes off. The unit will be turned off automatically after about a second.

When a power interruption occurs
If the clock shows "0:00" and the dots blink, all the timer settings have been erased. Reset the clock time and the timer settings.

AFTER TIMER RECORDING

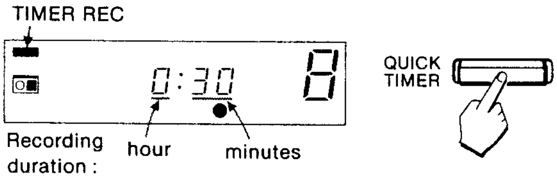
When a timer recording is finished, the programming (except the everyday setting) will be deleted automatically.

1-8. QUICK TIMER RECORDING

—To set the recording duration and to turn off the unit automatically

During recording, you can set the recording duration for up to 4 hours in units of 30 minutes by pressing the QUICK TIMER button. After the preset time has elapsed, recording stops and the recorder is turned off automatically.

1 Start recording.
2 Press the QUICK TIMER button to set the recording duration.
The TIMER REC indication will appear.



Each time you press the QUICK TIMER button, the indication changes :

0:30 → 1:00 → 1:30 → 2:00 → ... 3:30 → 4:00

As the recording continues, the duration indication decreases minute by minute to 0:00 and the recording stops. The recorder is turned off automatically.

Note
When the TIMER REC indication is displayed, no function of the recorder can be activated.

To extend the recording duration
The on-going recording duration can be extended simply by pressing the QUICK TIMER button.
The duration will be extended in units of 30 minutes with each pressing.
Example: When 2:25 is indicated,
2:25 → 2:30 → 3:00 ...

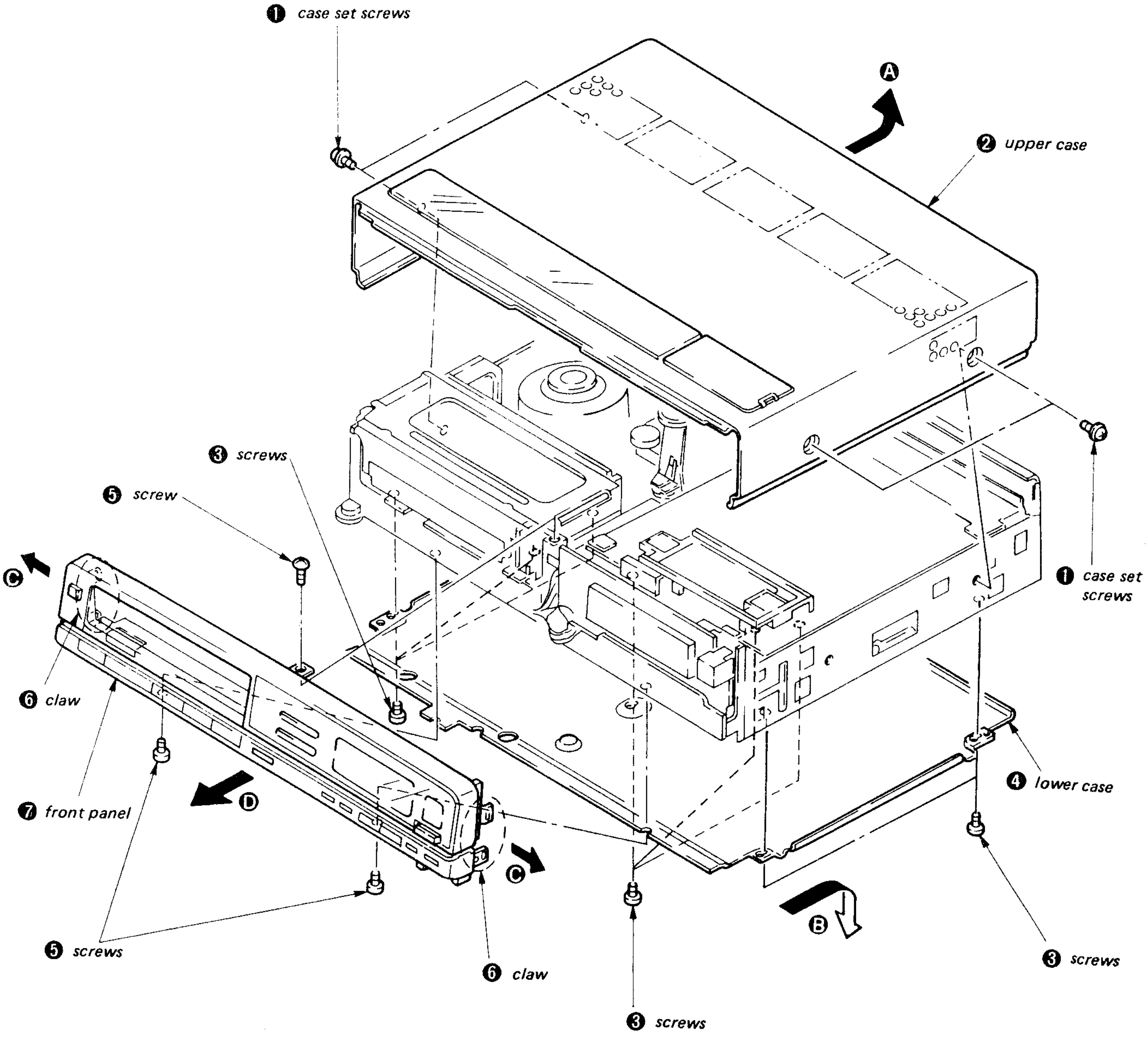
To cancel the quick timer function
Press the TIMER REC ON/OFF button so that the TIMER REC indication goes off. The recorder will be turned off automatically after about a second.

SECTION 2
DISASSEMBLY

2-1. DISASSEMBLY OF CABINET

1) Remove the four case set screws ❶ .
2) Remove the upper case ❷ in the direction shown by the arrow Ⓐ .
3) Loosen the eight screws (BVTP3 x 8) ❸ .
4) Remove the lower case ❹ in the direction shown by the arrow Ⓑ .
5) Remove the three screws (BVTP3 x 8) ❺ .
6) Remove the two claws ❻ in the direction shown by the arrow Ⓒ , then remove the front panel ❼ in the direction shown by the arrow Ⓓ .

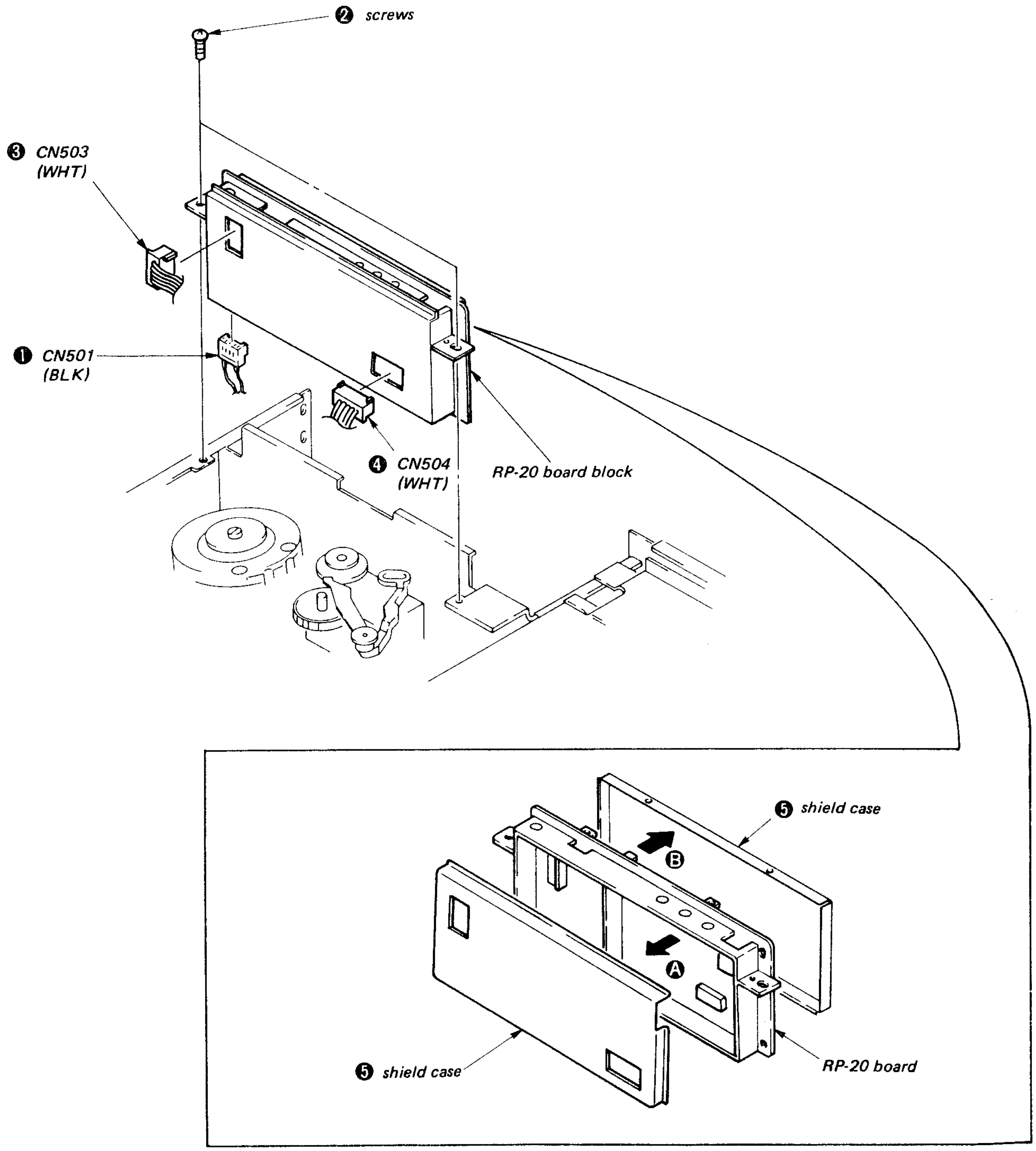
Note: Follow the disassembly procedure in the numerical order given.



❶ case set screws
Ⓐ
❷ upper case
❸ screws
❺ screw
Ⓒ
❶ case set screws
❻ claw
❹ lower case
❼ front panel
Ⓓ
Ⓒ
Ⓑ
❺ screws
❻ claw
❸ screws
❸ screws

2-2. REMOVAL OF THE RP-20 BOARD

1) Pull out the connector CN501 ❶ .
2) Remove the two screws (BVTP3 x 8) ❷ .
3) Pull out the three connectors (CN503, CN504) ❸ , ❹ .
4) Remove the two shield cases ❺ in the direction shown by the arrows Ⓐ and Ⓑ .

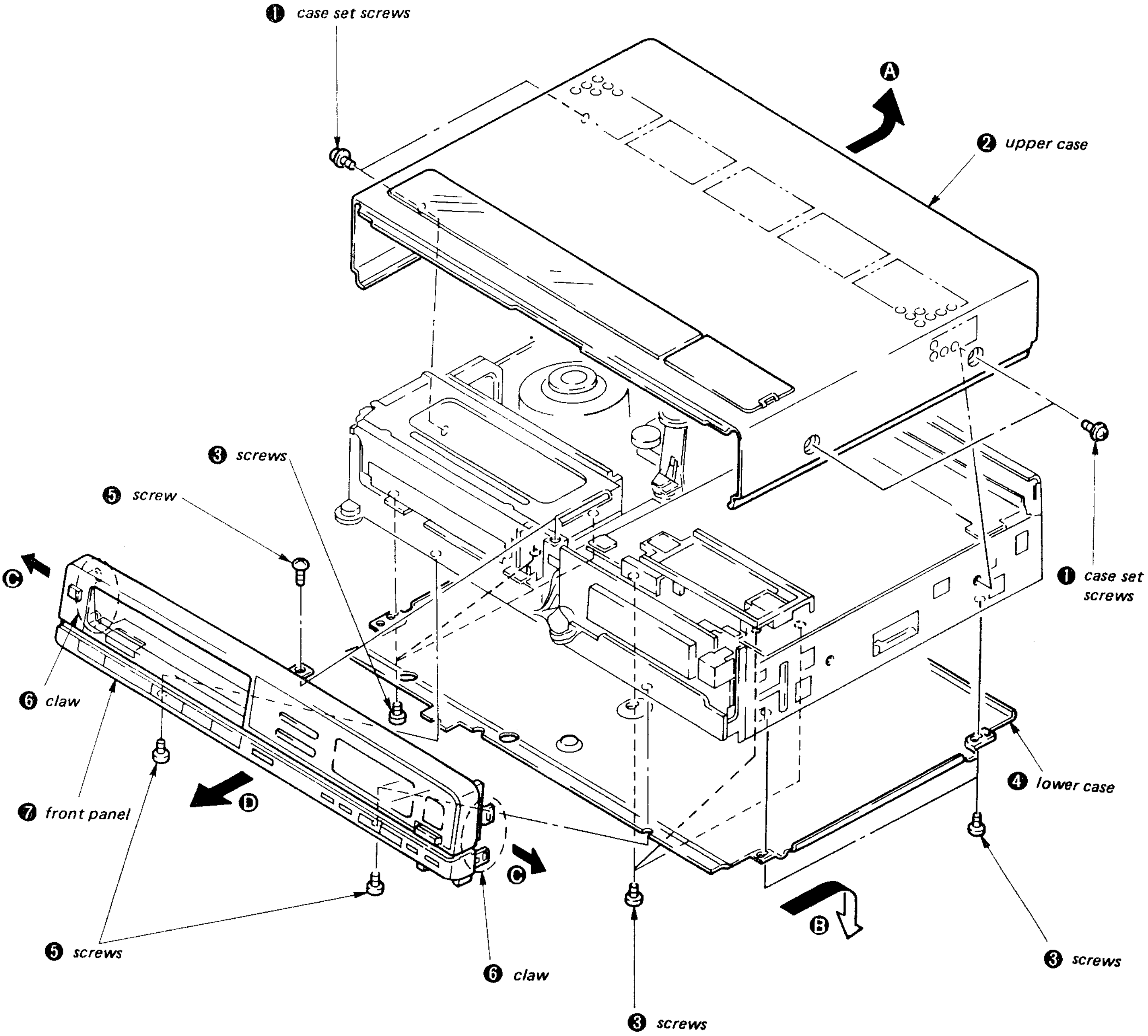

❷ screws
❸ CN503 (WHT)
❶ CN501 (BLK)
❹ CN504 (WHT)
RP-20 board block
❺ shield case
Ⓑ
Ⓐ
❺ shield case
RP-20 board

SECTION 2
DISASSEMBLY

2-1. DISASSEMBLY OF CABINET

1) Remove the four case set screws ❶ .
2) Remove the upper case ❷ in the direction shown by the arrow Ⓐ .
3) Loosen the eight screws (BVTP3 x 8) ❸ .
4) Remove the lower case ❹ in the direction shown by the arrow Ⓑ .
5) Remove the three screws (BVTP3 x 8) ❺ .
6) Remove the two claws ❻ in the direction shown by the arrow Ⓒ , then remove the front panel ❼ in the direction shown by the arrow Ⓓ .

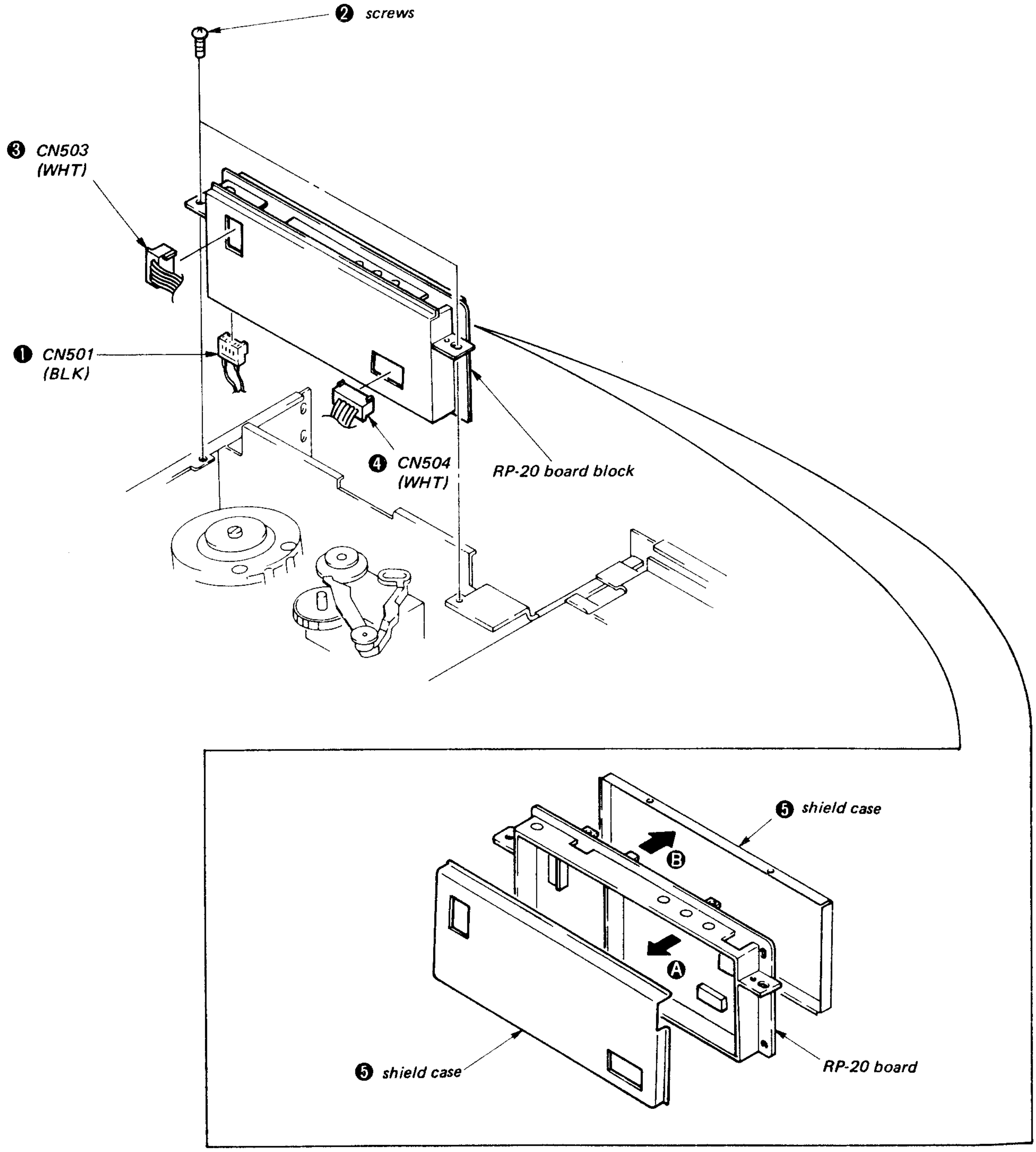
Note: Follow the disassembly procedure in the numerical order given.



❶ case set screws
Ⓐ
❷ upper case
❸ screws
❺ screw
Ⓒ
❶ case set screws
❻ claw
❼ front panel
Ⓓ
❹ lower case
Ⓒ
❺ screws
Ⓑ
❸ screws
❻ claw
❸ screws

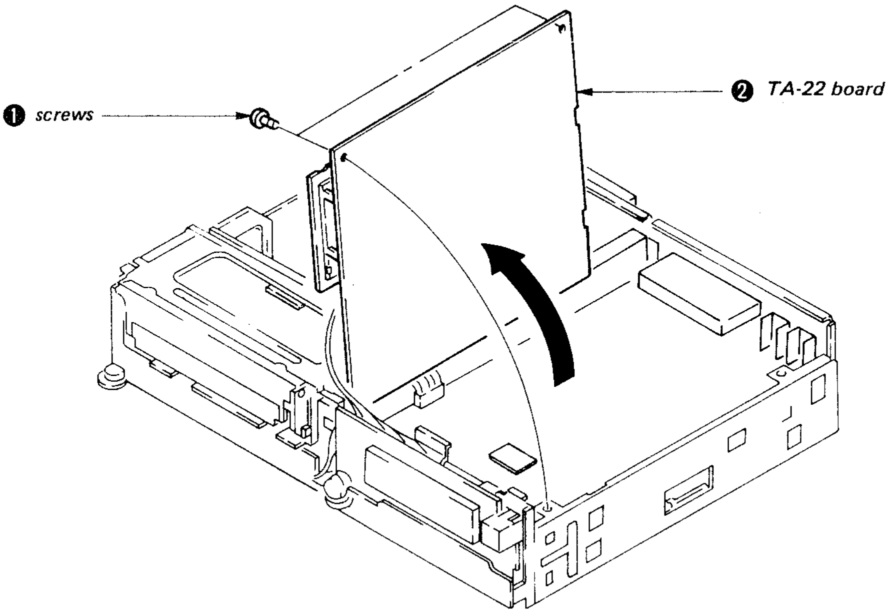
2-2. REMOVAL OF THE RP-20 BOARD

1) Pull out the connector CN501 ❶ .
2) Remove the two screws (BVTP3 x 8) ❷ .
3) Pull out the three connectors (CN503, CN504) ❸ , ❹ .
4) Remove the two shield cases ❺ in the direction shown by the arrows Ⓐ and Ⓑ .


❷ screws
❸ CN503 (WHT)
❶ CN501 (BLK)
❹ CN504 (WHT)
RP-20 board block
❺ shield case
Ⓑ
Ⓐ
❺ shield case
RP-20 board

2-3. REMOVAL OF THE TA-22 BOARD

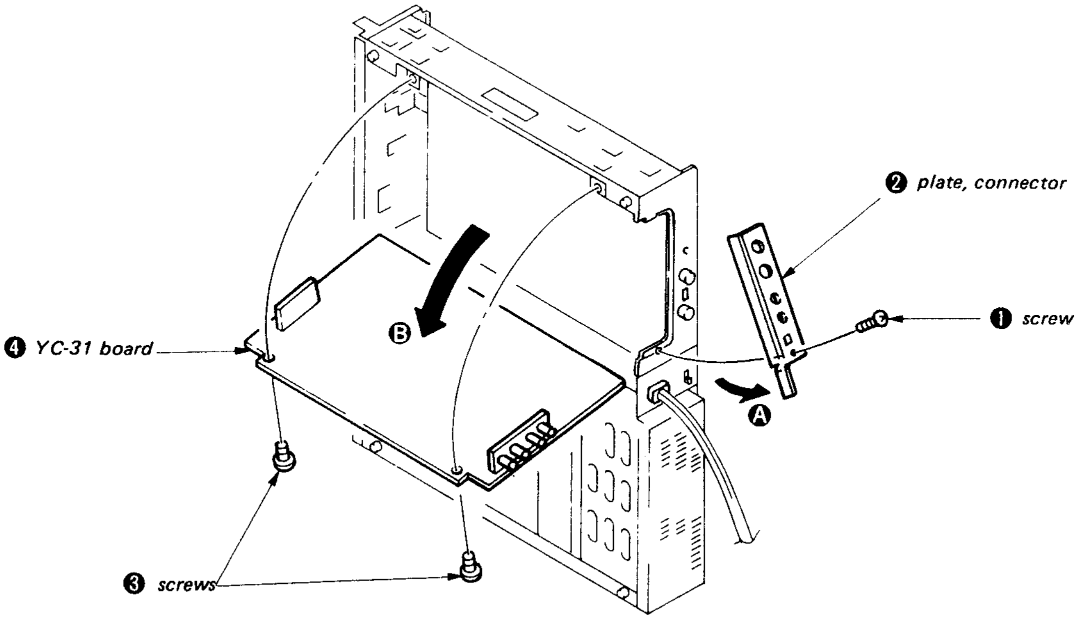
1) Remove the two screws (BVTP3 x 8) ❶ .
2) Remove the TA-22 board ❷ in the direction shown by the arrow.



❶ screws
❷ TA-22 board

2-4. REMOVAL OF THE YC-31 BOARD

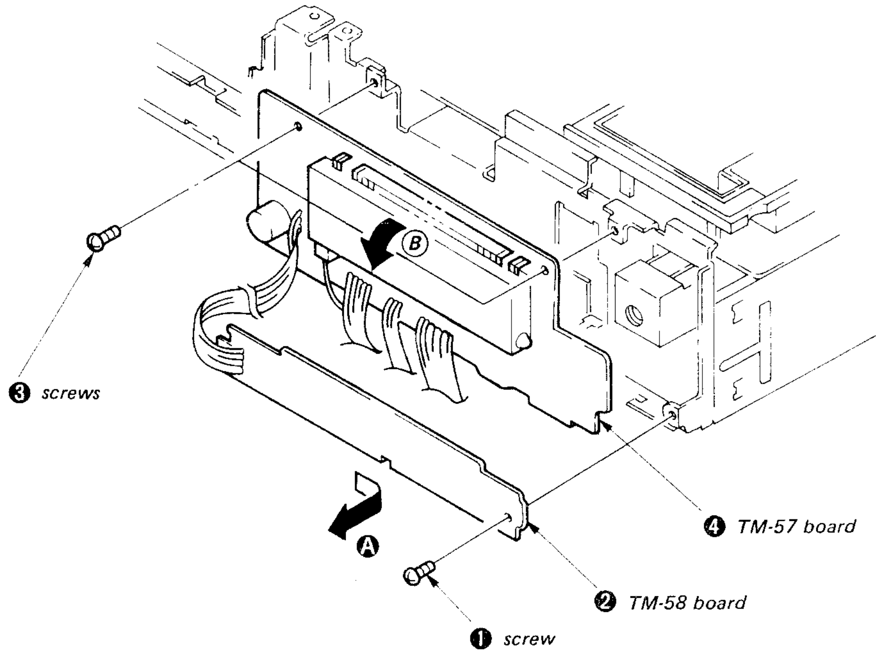
1) Stand the set with the left side panel on the bottom.
2) Remove the screw (BVTP3 x 8) ❶ .
3) Remove the plate, connector ❷ in the direction shown by the arrow Ⓐ .
4) Remove the two screws (BVTP3 x 8) ❸ .
5) Remove the YC-31 board ❹ in the direction shown by the arrow Ⓑ .



❷ plate, connector
❶ screw
❹ YC-31 board
Ⓑ
Ⓐ
❸ screws

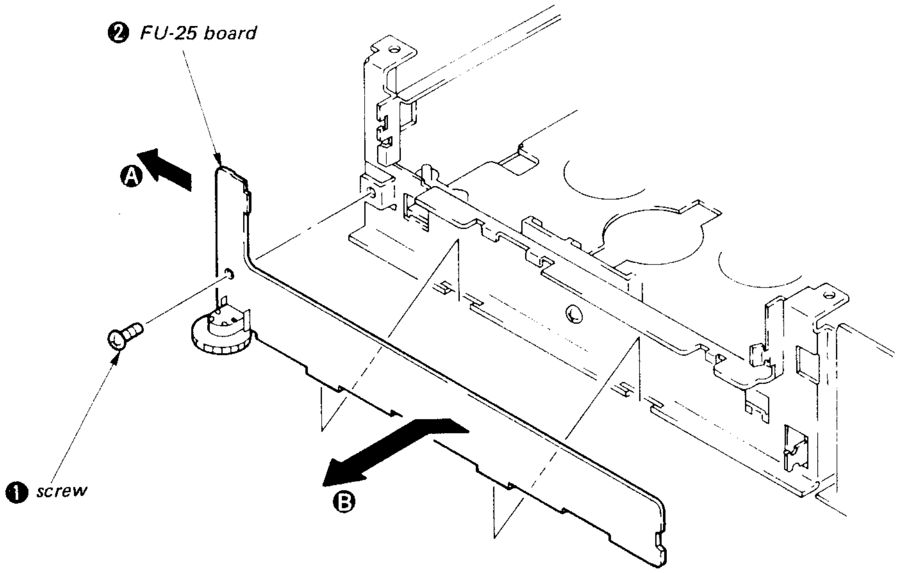
2-5. REMOVAL OF THE TIMER BLOCK

1) Remove the screw (BVTP3 x 8) ❶ .
2) Remove the TM-58 board ❷ in the direction shown by the arrow Ⓐ .
3) Remove the two screws (BVTP3 x 8) ❸ .
4) Remove the TM-57 board ❹ in the direction shown by the arrow Ⓑ .


Ⓑ
❸ screws
❹ TM-57 board
Ⓐ
❷ TM-58 board
❶ screw

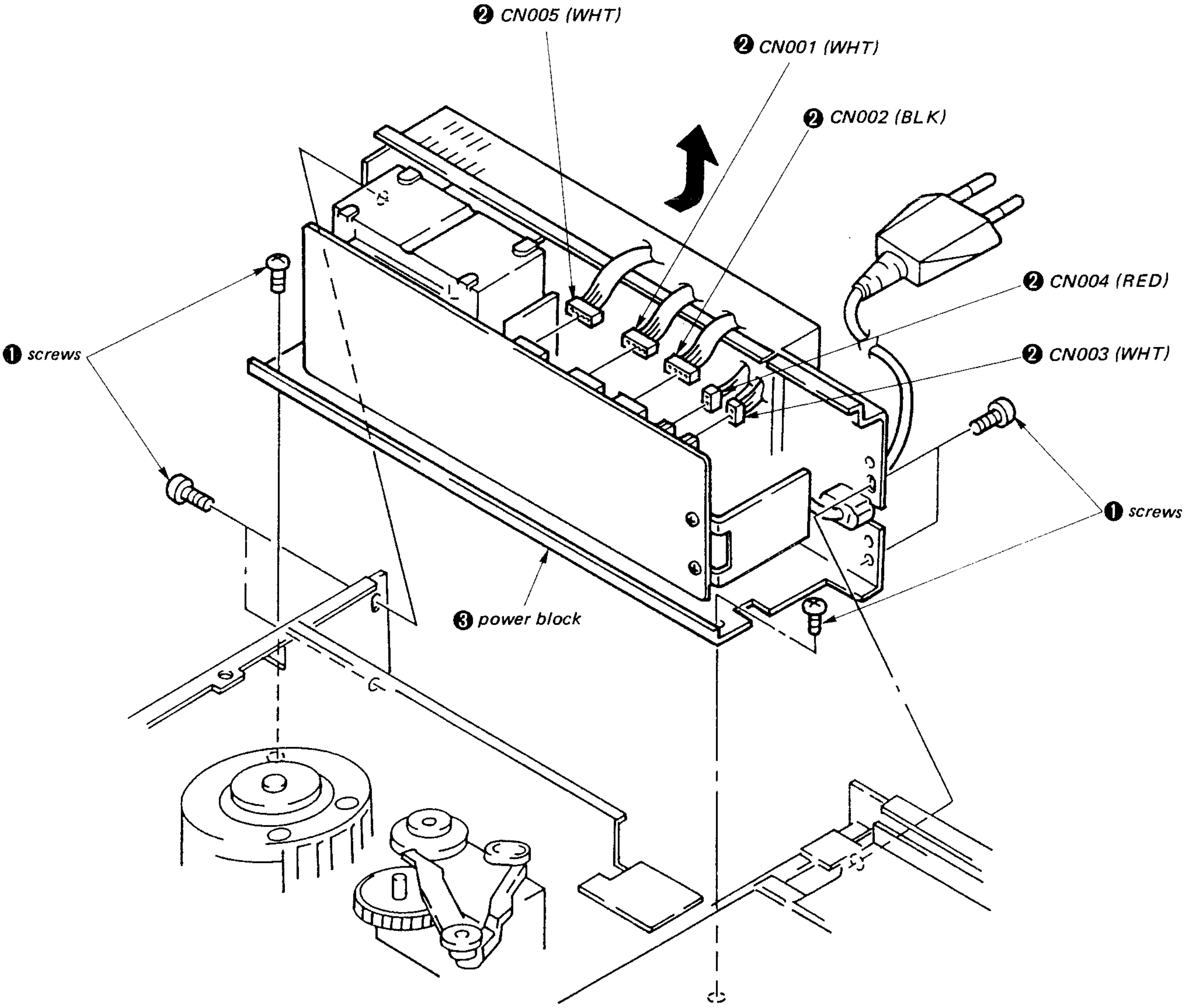
2-6. REMOVAL OF THE FU-25 BOARD

1) Remove the screw (BVTP3 x 8) ❶ .
2) Remove the FU-25 board ❷ in the direction shown by the arrow Ⓐ , then remove in the direction shown by the arrow Ⓑ .


❷ FU-25 board
Ⓐ
❶ screw
Ⓑ

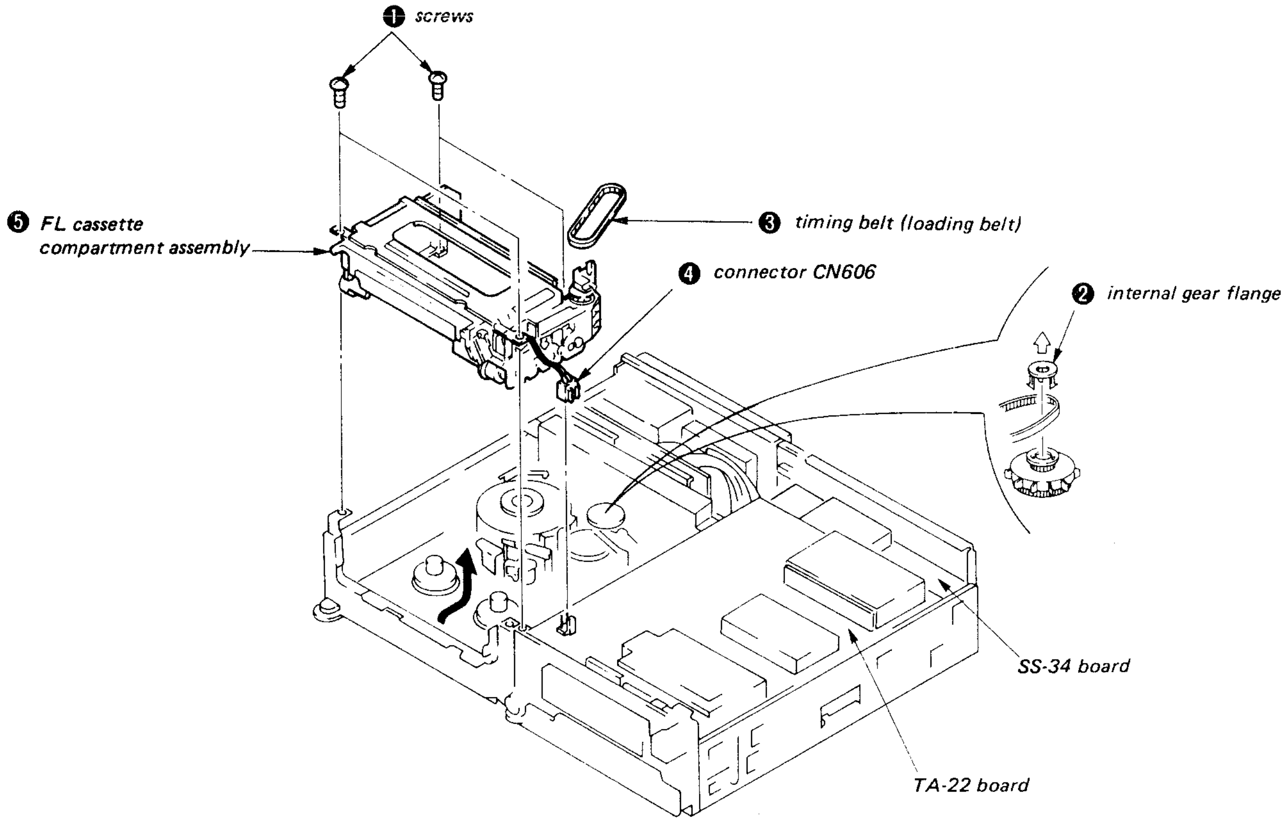
2-7. REMOVAL OF THE POWER BLOCK

1) Remove the six screws (BVTP3 x 8) ❶ .
2) Pull out the five connectors (CN001, CN002, CN003, CN004, CN005) ❷ .
3) Remove the power block ❸ in the direction shown by the arrow.


❷ CN005 (WHT)
❷ CN001 (WHT)
❷ CN002 (BLK)
❷ CN004 (RED)
❷ CN003 (WHT)
❶ screws
❶ screws
❸ power block

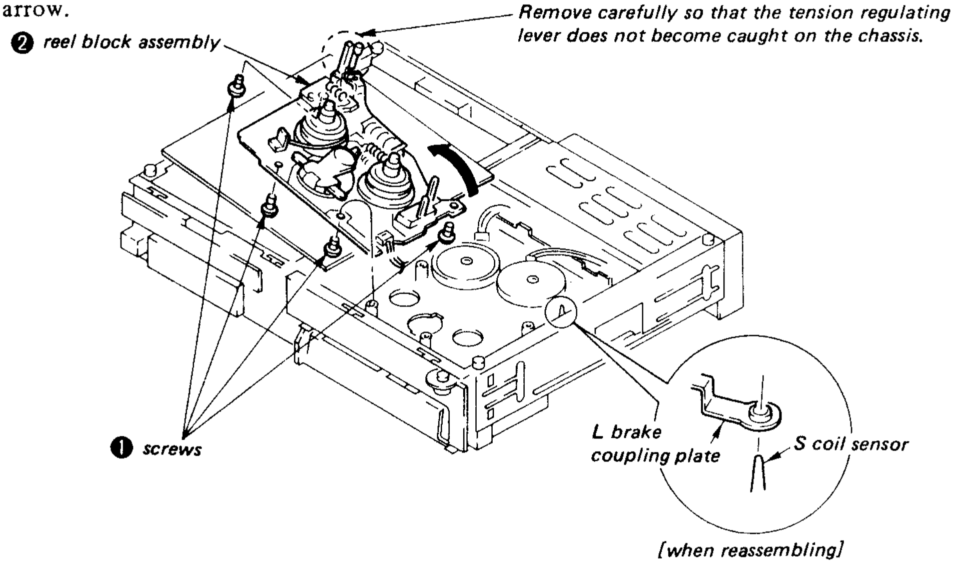
2-8. REMOVAL OF THE FL CASSETTE COMPARTMENT ASSEMBLY

1) Remove the four screws (BVTP3 x 8) ❶ .
2) Remove the internal gear flange ❷ .
3) Remove the timing belt (loading belt) ❸ .
4) Pull out the connector CN606 ❹ , on the SS-34 board.
5) Remove the FL cassette compartment assembly ❺ in the direction shown by the arrow.


❶ screws
❺ FL cassette compartment assembly
❸ timing belt (loading belt)
❹ connector CN606
❷ internal gear flange
SS-34 board
TA-22 board

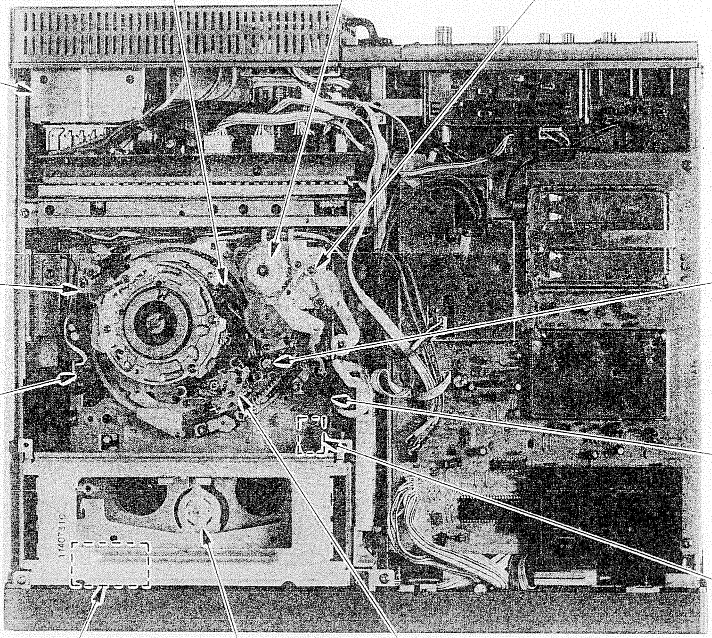
2-9. REMOVAL OF THE REEL BLOCK ASSEMBLY

1) Remove the four screws (BVTP3 x 8) ❶ .
2) Remove the reel block assembly ❷ in the direction shown by the arrow.

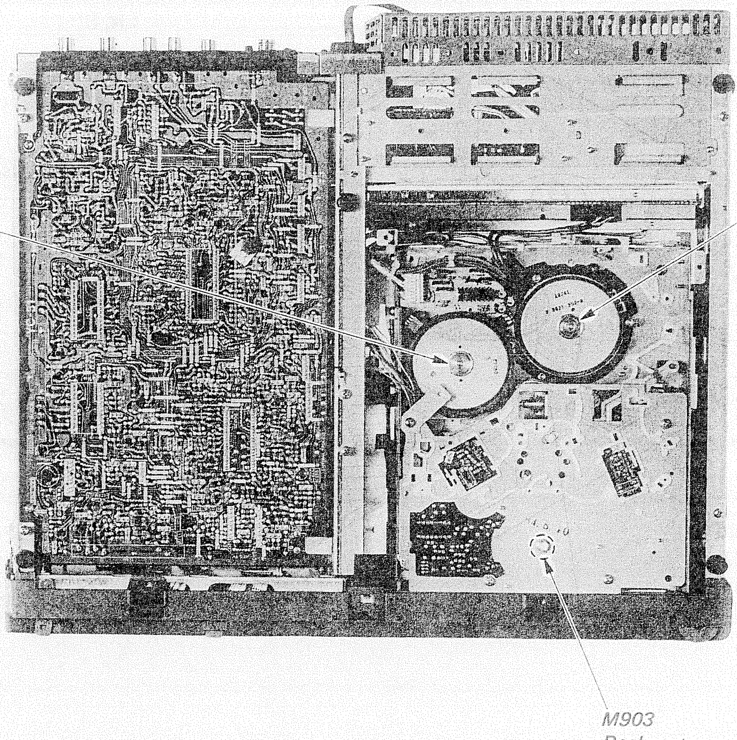

❷ reel block assembly
Remove carefully so that the tension regulating lever does not become caught on the chassis.
❶ screws
L brake coupling plate
S coil sensor
[when reassembling]

2-10. INTERNAL VIEW

— Top Side —

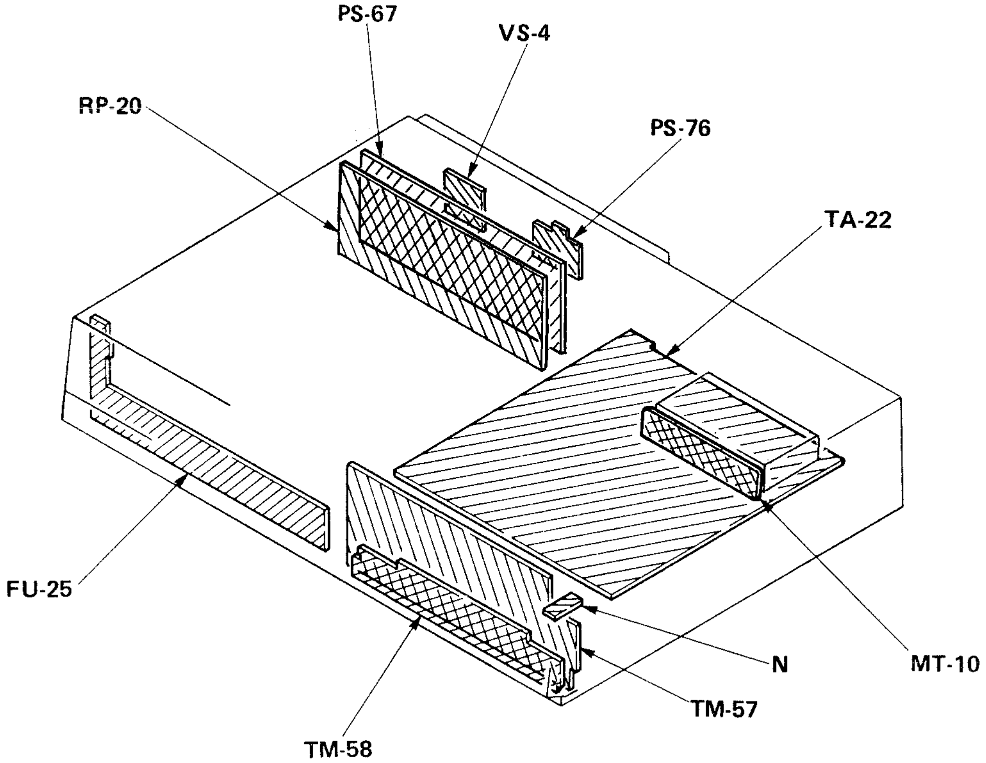

Full erase head
M904
Loading motor
PM901
Plunger solenoid
T901
Power transformer
S903
Leafswitch
threading end
Capstan
L901
S coil sensor
S902
Leaf switch
cassette in
S901 Leaf switch
record proof
L902
T coil sensor,
REW sensor
Pendulum arm ass'y
ACE ass'y

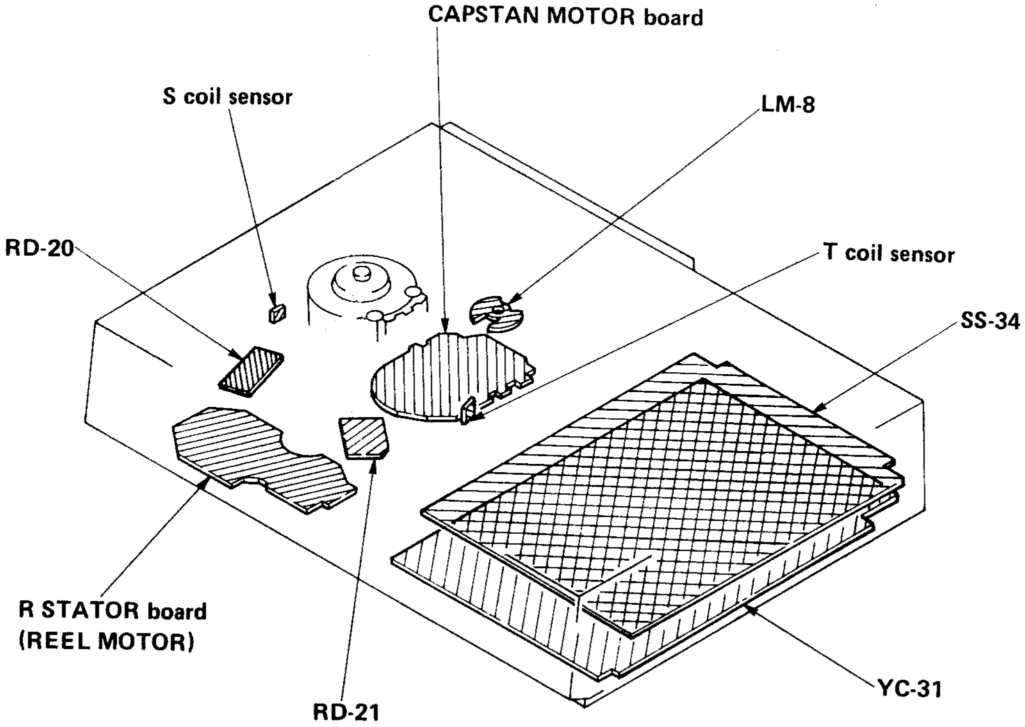
— Bottom Side —


M901
Drum motor ass'y
M902
Capstan motor ass'y
M903
Reel motor ass'y

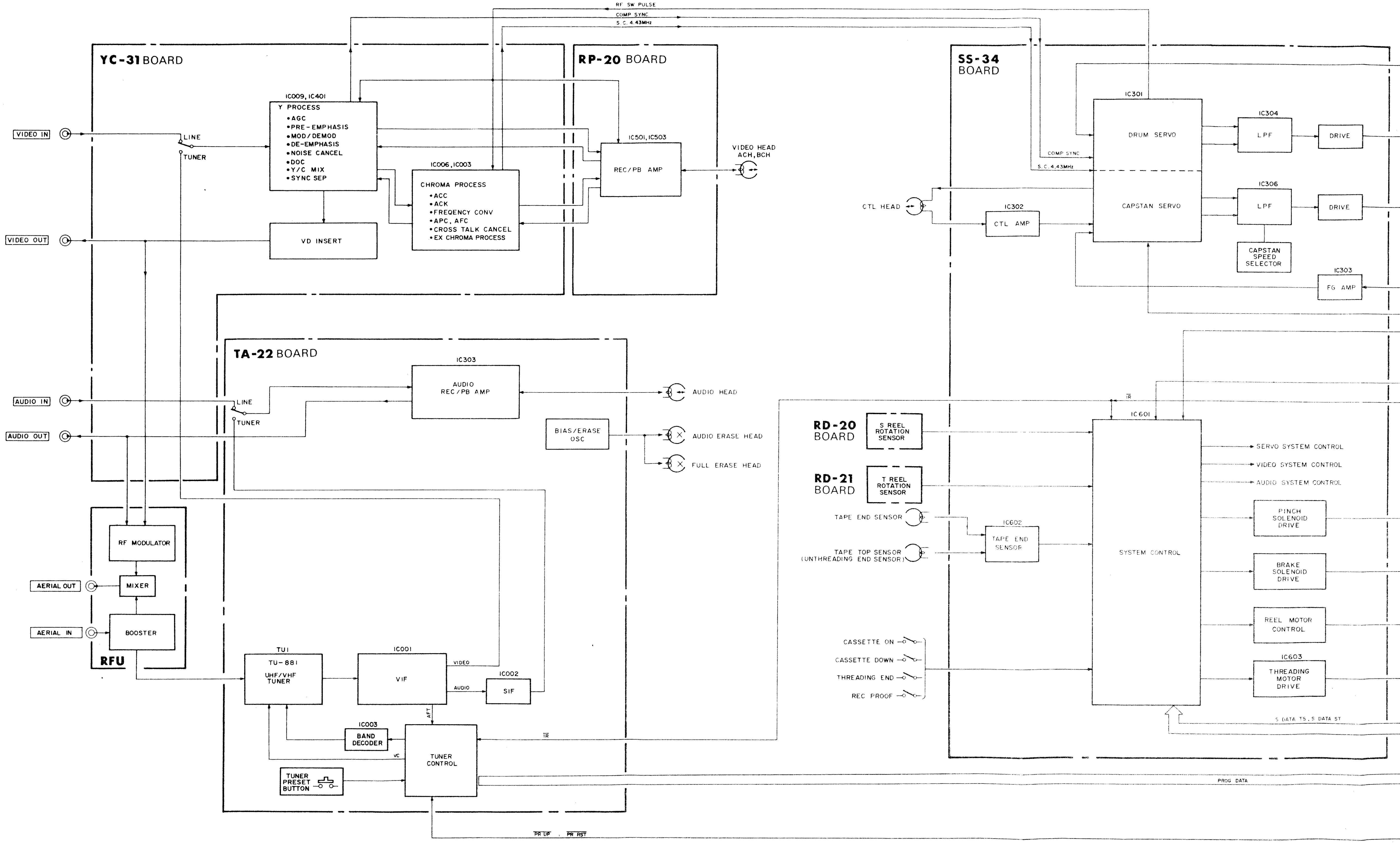
SECTION 3
DIAGRAMS

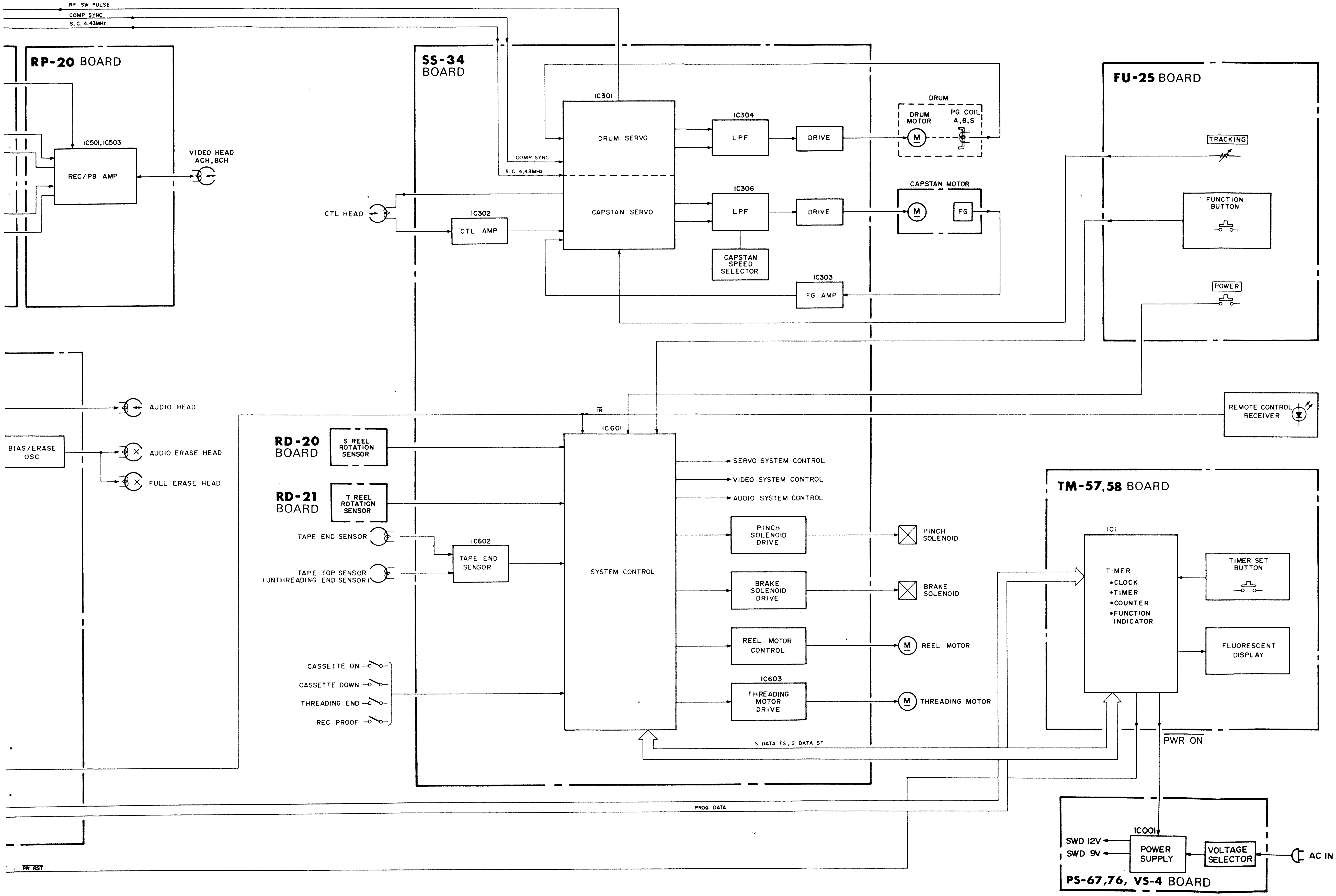
3-1. CIRCUIT BOARDS LOCATION


PS-67
VS-4
RP-20
PS-76
TA-22
FU-25
N
MT-10
TM-57
TM-58

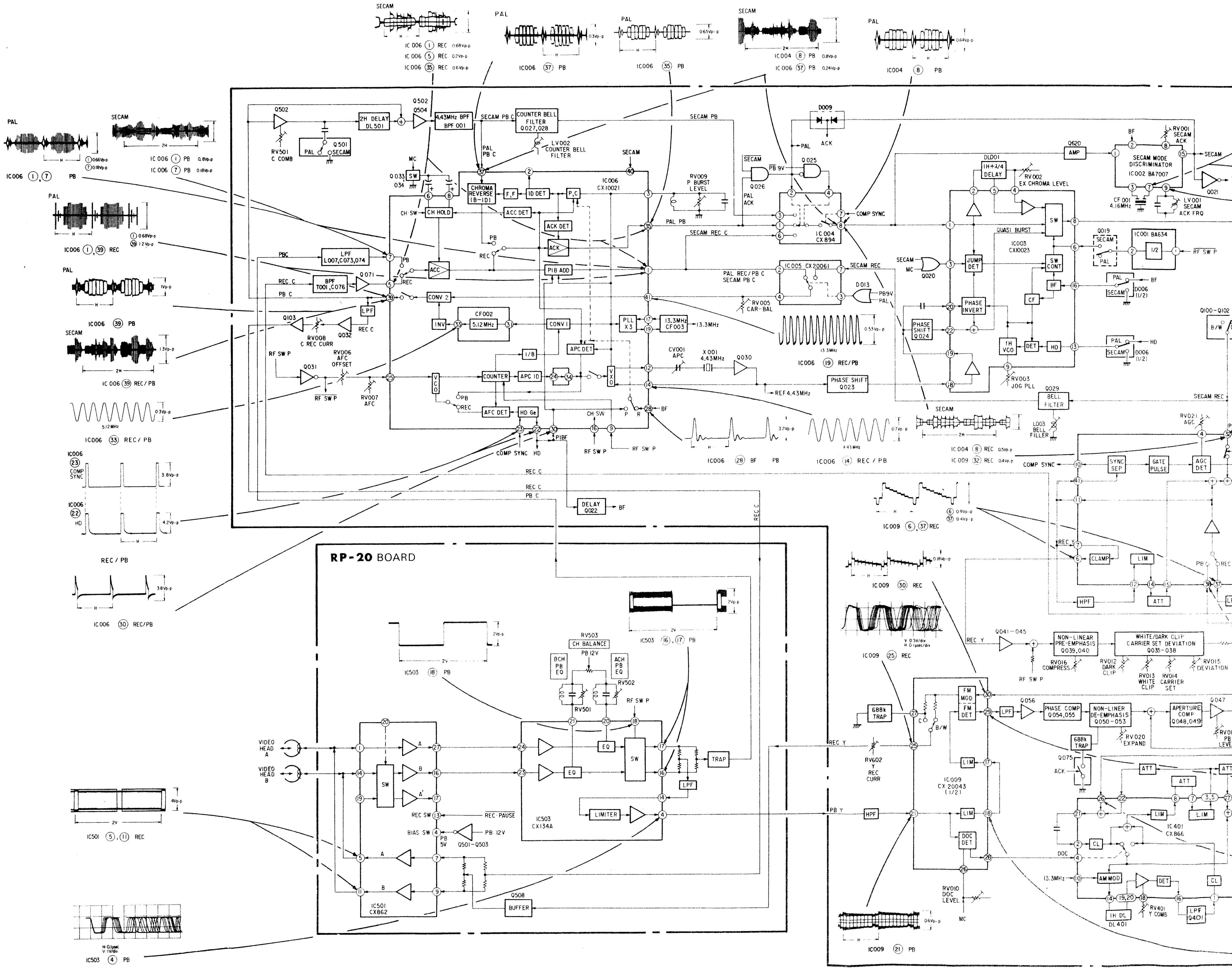

CAPSTAN MOTOR board
S coil sensor
LM-8
RD-20
T coil sensor
SS-34
R STATOR board
(REEL MOTOR)
YC-31
RD-21

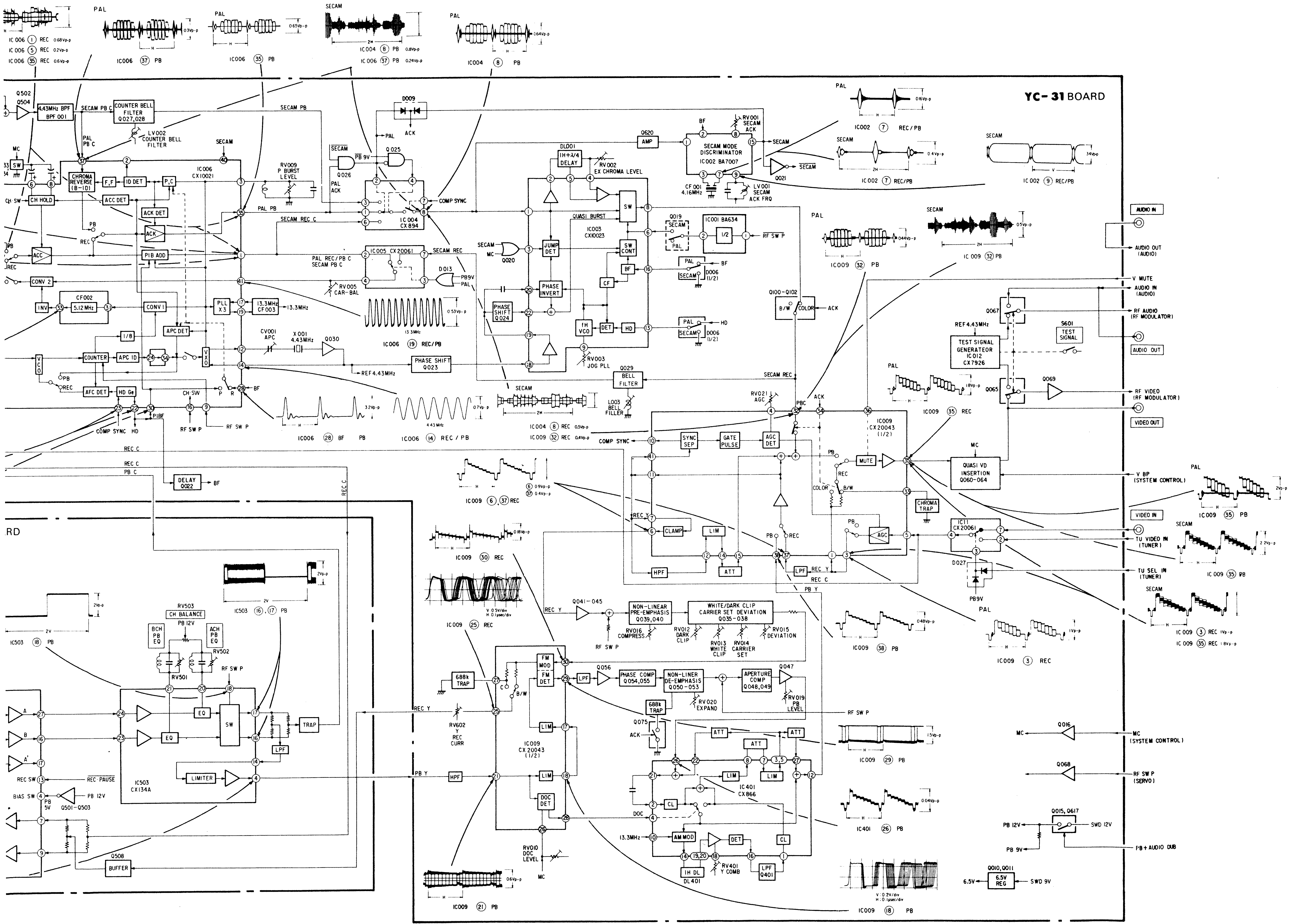
3-2. OVERALL BLOCK DIAGRAM


RF SW PULSE
COMP SYNC
S.C 4.43MHz
YC-31 BOARD
IC009, IC401
Y PROCESS
•AGC
•PRE-EMPHASIS
•MOD/DEMOD
•DE-EMPHASIS
•NOISE CANCEL
•DOC
•Y/C MIX
•SYNC SEP
IC006, IC003
CHROMA PROCESS
•ACC
•ACK
•FREQENCY CONV
•APC, AFC
•CROSS TALK CANCEL
•EX CHROMA PROCESS
VD INSERT
VIDEO IN
VIDEO OUT
LINE
TUNER
RP-20 BOARD
IC501, IC503
REC/PB AMP
VIDEO HEAD
ACH, BCH
SS-34
BOARD
IC301
DRUM SERVO
CAPSTAN SERVO
COMP SYNC
S.C 4.43MHz
IC304
LPF
DRIVE
IC306
LPF
DRIVE
CAPSTAN
SPEED
SELECTOR
IC303
FG AMP
CTL HEAD
IC302
CTL AMP
TA-22 BOARD
IC303
AUDIO
REC/PB AMP
AUDIO IN
AUDIO OUT
LINE
TUNER
BIAS/ERASE
OSC
AUDIO HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
RD-20
BOARD
S REEL
ROTATION
SENSOR
RD-21
BOARD
T REEL
ROTATION
SENSOR
TAPE END SENSOR
TAPE TOP SENSOR
(UNTHREADING END SENSOR)
IC602
TAPE END
SENSOR
IR
IC601
SYSTEM CONTROL
SERVO SYSTEM CONTROL
VIDEO SYSTEM CONTROL
AUDIO SYSTEM CONTROL
PINCH
SOLENOID
DRIVE
BRAKE
SOLENOID
DRIVE
REEL MOTOR
CONTROL
IC603
THREADING
MOTOR
DRIVE
CASSETTE ON
CASSETTE DOWN
THREADING END
REC PROOF
S DATA TS, S DATA ST
RF MODULATOR
MIXER
BOOSTER
AERIAL OUT
AERIAL IN
RFU
TU1
TU-881
UHF/VHF
TUNER
IC001
VIF
VIDEO
AUDIO
IC002
SIF
AFT
IC003
BAND
DECODER
VC
TUNER
CONTROL
IR
TUNER
PRESET
BUTTON
PROG DATA
PR UP, PR RST

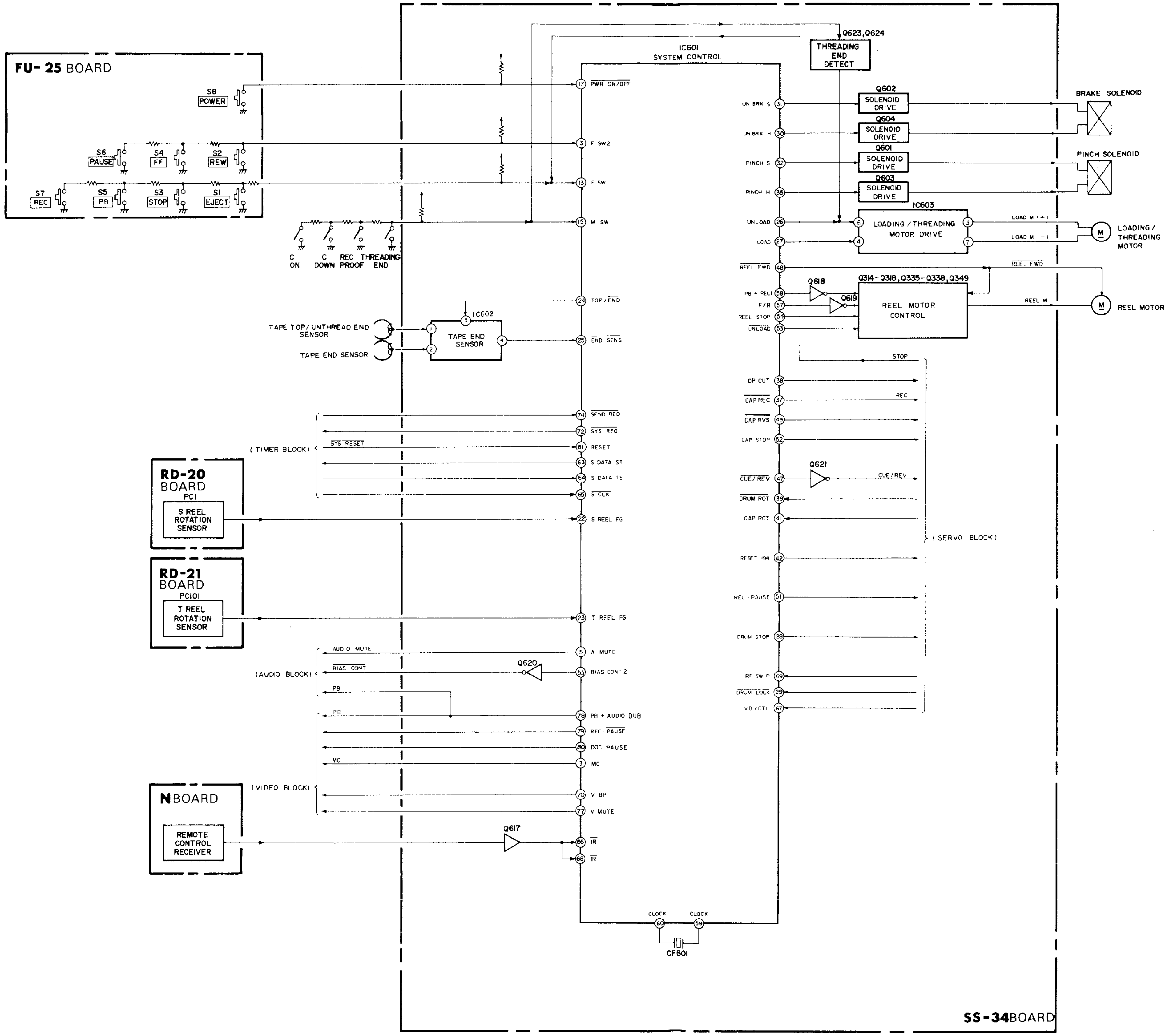

RF SW PULSE
COMP SYNC
S.C. 4.43MHz
RP-20 BOARD
IC501, IC503
REC/PB AMP
VIDEO HEAD
ACH, BCH
SS-34
BOARD
IC301
DRUM SERVO
COMP SYNC
S.C. 4.43MHz
CAPSTAN SERVO
IC304
LPF
DRIVE
DRUM
DRUM
MOTOR
PG COIL
A,B,S
M
IC306
LPF
DRIVE
CAPSTAN MOTOR
M
FG
CAPSTAN
SPEED
SELECTOR
IC303
FG AMP
CTL HEAD
IC302
CTL AMP
FU-25 BOARD
TRACKING
FUNCTION
BUTTON
POWER
REMOTE CONTROL
RECEIVER
IR
AUDIO HEAD
BIAS/ERASE
OSC
AUDIO ERASE HEAD
FULL ERASE HEAD
RD-20
BOARD
S REEL
ROTATION
SENSOR
RD-21
BOARD
T REEL
ROTATION
SENSOR
TAPE END SENSOR
TAPE TOP SENSOR
(UNTHREADING END SENSOR)
IC602
TAPE END
SENSOR
IC601
SYSTEM CONTROL
SERVO SYSTEM CONTROL
VIDEO SYSTEM CONTROL
AUDIO SYSTEM CONTROL
PINCH
SOLENOID
DRIVE
PINCH
SOLENOID
BRAKE
SOLENOID
DRIVE
BRAKE
SOLENOID
REEL MOTOR
CONTROL
M
REEL MOTOR
IC603
THREADING
MOTOR
DRIVE
M
THREADING MOTOR
CASSETTE ON
CASSETTE DOWN
THREADING END
REC PROOF
S DATA TS, S DATA ST
PROG DATA
PR RST
TM-57,58 BOARD
IC1
TIMER
•CLOCK
•TIMER
•COUNTER
•FUNCTION
INDICATOR
TIMER SET
BUTTON
FLUORESCENT
DISPLAY
PWR ON
IC001
SWD 12V
SWD 9V
POWER
SUPPLY
VOLTAGE
SELECTOR
AC IN
PS-67,76, VS-4 BOARD

3-3. VIDEO BLOCK DIAGRAM


RP-20 BOARD
IC006 CX10021
IC004 CX894
IC005 CX20061
IC003 CX10023
IC002 BA7007
IC001 BA634
IC009 CX 20043 (1/2)
IC401 CX866
IC501 CX862
IC503 CX134A
2H DELAY DL501
4.43MHz BPF BPF 001
COUNTER BELL FILTER Q027,028
CHROMA REVERSE (B-ID)
F.F
ID DET
P.C
ACC DET
ACK DET
ACK
PIB ADD
ACC
CH HOLD
CONV 2
CONV 1
INV
CF002 5.12MHz
PLL X3
13.3MHz CF003
1/8
APC DET
COUNTER
APC ID
VXO
VCO
AFC DET
HD Ge
LPF L007,C073,074
BPF T001,C076
DELAY Q022
PHASE SHIFT Q023
SECAM MODE DISCRIMINATOR
DL001 1H+λ/4 DELAY
RV002 EX CHROMA LEVEL
JUMP DET
PHASE INVERT
PHASE SHIFT Q024
SW CONT
1H VCO
BELL FILTER Q029
SYNC SEP
GATE PULSE
AGC DET
CLAMP
LIM
ATT
HPF
NON-LINEAR PRE-EMPHASIS Q039,040
WHITE/DARK CLIP CARRIER SET DEVIATION Q035-038
FM MOD
FM DET
PHASE COMP Q054,055
NON-LINER DE-EMPHASIS Q050-053
APERTURE COMP Q048,049
688k TRAP
DOC DET
AM MOD
1H DL DL401
LPF Q401
CH BALANCE
BCH PB EQ
ACH PB EQ
EQ
SW
TRAP
LIMITER
BUFFER Q508
VIDEO HEAD A
VIDEO HEAD B
REC SW
BIAS SW
REC PAUSE
PB 12V
Q501-Q503
RV501 C COMB
RV008 C REC CURR
RV006 AFC OFFSET
RV007 AFC
RV009 P BURST LEVEL
RV005 CAR-BAL
CV001 APC
X001 4.43MHz
REF 4.43MHz
RV003 JOG PLL
RV001 SECAM ACK
LV001 SECAM ACK FRQ
LV002 COUNTER BELL FILTER
CF001 4.16MHz
L003 BELL FILLER
RV021 AGC
RV016 COMPRESS
RV012 DARK CLIP
RV013 WHITE CLIP
RV014 CARRIER SET
RV015 DEVIATION
RV020 EXPAND
RV010 DOC LEVEL
RV401 Y COMB
RV602 Y REC CURR
COMP SYNC
REC C
PB C
REC Y
PB Y
RF SW P
SECAM
PAL
IC006 ①,⑦ PB
IC006 ①,㊴ REC
IC006 ㊴ PB
IC006 ㊴ REC/PB
IC006 ㉝ REC/PB
IC006 ㉓ COMP SYNC
IC006 ㉒ HD
IC006 ㉚ REC/PB
IC006 ㊲ PB
IC006 ㉟ PB
IC006 ⑲ REC/PB
IC006 ㉘ BF PB
IC006 ⑭ REC/PB
IC004 ⑧ PB
IC004 ⑧ REC
IC009 ㉜ REC
IC009 ⑥,㊲ REC
IC009 ㉚ REC
IC009 ㉕ REC
IC009 ㉑ PB
IC503 ⑱ PB
IC503 ⑯,⑰ PB
IC503 ④ PB
IC501 ⑤,⑪ REC


YC-31 BOARD
IC006 ① REC 0.68Vp-p
IC006 ⑤ REC 0.2Vp-p
IC006 ㉟ REC 0.6Vp-p
PAL
IC006 ㊲ PB
IC006 ㉟ PB
SECAM
IC004 ⑧ PB 0.8Vp-p
IC006 ㊲ PB 0.24Vp-p
IC004 ⑧ PB
Q502
Q504
4.43MHz BPF
BPF 001
SECAM PB C
COUNTER BELL FILTER Q027,028
SECAM PB
LV002 COUNTER BELL FILTER
PAL PB C
CHROMA REVERSE (B-ID)
F,F
ID DET
P,C
ACC DET
CH HOLD
ACK DET
ACK
P1B ADD
ACC
CONV 2
CF002 5.12MHz
INV
CONV 1
APC DET
1/B
COUNTER
APC ID
VCO
VXO
AFC DET
HD Ge
COMP SYNC
HD
P1BF
CH SW
RF SW P
IC006 CX10021
RV009 P BURST LEVEL
PAL PB
SECAM REC C
PAL REC/PB C
SECAM PB C
RV005 CAR-BAL
PLL X3
13.3MHz CF003
CV001 APC
X001 4.43MHz
Q030
REF 4.43MHz
PHASE SHIFT Q023
IC006 ⑲ REC/PB
IC006 ㉘ BF PB
IC006 ⑭ REC/PB
D009
ACK
PAL ACK
Q025
Q026
IC004 CX894
COMP SYNC
IC005 CX20061
SECAM REC
D013
PB9V
DL001 1H+λ/4 DELAY
RV002 EX CHROMA LEVEL
QUASI BURST
IC003 CX10023
JUMP DET
Q020
PHASE INVERT
PHASE SHIFT Q024
1H VCO
DET
HD
CF
BF
SW CONT
RV003 JOG PLL
Q029 BELL FILTER
L003 BELL FILLER
SECAM REC
IC004 ⑧ REC 0.5Vp-p
IC009 ㉜ REC 0.4Vp-p
Q620 AMP
SECAM MODE DISCRIMINATOR IC002 BA7007
RV001 SECAM ACK
CF001 4.16MHz
LV001 SECAM ACK FRQ
Q021
Q019
IC001 BA634 1/2
RF SW P
D006 (1/2)
IC002 ⑦ REC/PB
IC002 ⑨ REC/PB
IC009 ㉜ PB
Q100-Q102 B/W COLOR
RV021 AGC
PBC
IC009 CX20043 (1/2)
SYNC SEP
GATE PULSE
AGC DET
MUTE
CHROMA TRAP
CLAMP
LIM
HPF
ATT
LPF
REC Y
REC C
PB Y
IC11 CX20061
D027
REF 4.43MHz
TEST SIGNAL GENERATEOR IC012 CX7926
S601 TEST SIGNAL
Q067
Q065
Q069
QUASI VD INSERTION Q060-064
AUDIO IN
AUDIO OUT (AUDIO)
V MUTE
AUDIO IN (AUDIO)
RF AUDIO (RF MODULATOR)
AUDIO OUT
RF VIDEO (RF MODULATOR)
VIDEO OUT
V BP (SYSTEM CONTROL)
VIDEO IN
TU VIDEO IN (TUNER)
TU SEL IN (TUNER)
IC009 ㉟ REC
IC009 ㉟ PB
IC009 ③ REC
IC009 ㊳ PB
IC009 ⑥, ㊲ REC
IC009 ㉚ REC
IC009 ㉕ REC
Q041-045
NON-LINEAR PRE-EMPHASIS Q039,040
WHITE/DARK CLIP CARRIER SET DEVIATION Q035-038
RV016 COMPRESS
RV012 DARK CLIP
RV013 WHITE CLIP
RV014 CARRIER SET
RV015 DEVIATION
688k TRAP
FM MOD
FM DET
Q056
PHASE COMP Q054,055
NON-LINER DE-EMPHASIS Q050-053
APERTURE COMP Q048,049
Q047
RV019 PB LEVEL
RV020 EXPAND
RV602 Y REC CURR
IC009 CX20043 (1/2)
DOC DET
RV010 DOC LEVEL
MC
Q075
IC401 CX866
AM MOD
1H DL DL401
RV401 Y COMB
LPF Q401
13.3MHz
IC009 ㉙ PB
IC401 ㉖ PB
IC009 ⑱ PB
IC009 ㉑ PB
Q016
MC (SYSTEM CONTROL)
Q068
RF SW P (SERVO)
Q015, Q617
SWD 12V
PB 12V
PB 9V
PB+AUDIO DUB
Q010,Q011 6.5V REG
6.5V
SWD 9V
RV503 CH BALANCE
PB 12V
BCH PB EQ
ACH PB EQ
RV501
RV502
EQ
SW
TRAP
LIMITER
IC503 CX134A
IC503 ⑯, ⑰ PB
IC503 ⑱ PB
REC SW
REC PAUSE
BIAS SW
PB 5V
Q501-Q503
Q508 BUFFER
DELAY Q022

3-4. SYSTEM CONTROL BLOCK DIAGRAM


FU-25 BOARD
S8 POWER
S6 PAUSE
S4 FF
S2 REW
S7 REC
S5 PB
S3 STOP
S1 EJECT
C ON
C DOWN
REC PROOF
THREADING END
IC601
SYSTEM CONTROL
17 PWR ON/OFF
3 F SW2
13 F SW1
15 M SW
24 TOP/END
25 END SENS
TAPE TOP/UNTHREAD END SENSOR
TAPE END SENSOR
IC602
TAPE END SENSOR
(TIMER BLOCK)
SYS RESET
74 SEND REQ
72 SYS REQ
61 RESET
63 S DATA ST
64 S DATA TS
65 S CLK
RD-20 BOARD
PC1
S REEL ROTATION SENSOR
22 S REEL FG
RD-21 BOARD
PC101
T REEL ROTATION SENSOR
23 T REEL FG
(AUDIO BLOCK)
AUDIO MUTE
BIAS CONT
PB
Q620
5 A MUTE
55 BIAS CONT 2
(VIDEO BLOCK)
PB
MC
78 PB + AUDIO DUB
79 REC · PAUSE
80 DOC PAUSE
3 MC
70 V BP
77 V MUTE
N BOARD
REMOTE CONTROL RECEIVER
Q617
66 IR
68 IR
CLOCK 60
CLOCK 59
CF601
Q623,Q624
THREADING END DETECT
31 UN BRK S
30 UN BRK H
32 PINCH S
35 PINCH H
26 UNLOAD
27 LOAD
48 REEL FWD
58 PB + REC1
57 F/R
54 REEL STOP
53 UNLOAD
Q602 SOLENOID DRIVE
Q604 SOLENOID DRIVE
Q601 SOLENOID DRIVE
Q603 SOLENOID DRIVE
BRAKE SOLENOID
PINCH SOLENOID
IC603
LOADING / THREADING MOTOR DRIVE
LOAD M (+)
LOAD M (−)
M
LOADING / THREADING MOTOR
REEL FWD
Q618
Q619
Q314-Q318, Q335-Q338, Q349
REEL MOTOR CONTROL
REEL M
M
REEL MOTOR
STOP
38 DP CUT
37 CAP REC
REC
49 CAP RVS
52 CAP STOP
Q621
47 CUE/REV
CUE/REV
39 DRUM ROT
41 CAP ROT
(SERVO BLOCK)
42 RESET 194
51 REC · PAUSE
28 DRUM STOP
69 RF SW P
29 DRUM LOCK
67 VD/CTL
SS-34 BOARD

3-5. SYSTEM CONTROL INTERFACE

[SYSTEM CONTROL-VIDEO BLOCK INTERFACE]

SIGNAL	I/O	IC601 Pin No.	STOP	FF	REW	PB	PB PAUSE	PICTURE SEARCH		REC OR TIMER REC	REC PAUSE	WAIT PAUSE	FR SEARCH	
								CUE	REV				CUE	REV
PAUSE	O	①	L	L	L	L	H	L	L	L	H	*2	L	L
MC	O	③	L	L	L	L	H	H	H	L	L	L	H	H
VBP	O	(70)	H	H	H	H	H	H	H	H	H	H	H	H
A'HEAD *1	O	(76)	L	L	L	L	L	L	L	L	L	L	L	L
V MUTE	O	(77)	L	L	L	L	L	L	L	L	L	L	L	L
PB + AUDIO DUB	O	(78)	L	L	L	H	H	H	H	L	L	L	H	H
REC. $\overline{\text{P}}$	O	(79)	L	L	L	L	L	L	L	H	L	L	L	L
DOC PAUSE *1	O	(80)	L	L	L	L	L	L	L	L	L	L	L	L

*1 : NOT USED
*2 : T = 2(SEC),
50% duty ratio pulse

[SYSTEM CONTROL-SERVO BLOCK INTERFACE]

SIGNAL	I/O	IC601 Pin No.	STOP	FF	REW	PB	PB PAUSE	PICTURE SEARCH		REC OR TIMER REC	REC PAUSE	WAIT PAUSE	FR SEARCH	
								CUE	REV				CUE	REV
S REEL FG	I	㉒	H/L	FG	FG	FG	H/L	FG	FG	FG	H/L	H/L	FG	FG
T REEL FG	I	㉓	H/L	FG	FG	FG	H/L	FG	FG	FG	H/L	H/L	FG	FG
DRUM STOP	O	㉘	H	L	L	L	L	L	L	L	L	H	L	L
$\overline{\text{DRUM LOCK}}$	I	㉙	L	H	H	H	H	H	H	H	H	L	H	H
$\overline{\text{BRK ADJ}}$ *1	O	㊱	H	H	H	H	H	H	H	H	H	H	H	H
REC	O	㊲	L	L	L	L	L	L	L	H	H	L	L	L
DP CUT	O	㊳	L	L	L	L	L	H	H	L	L	L	H	H
DRUM ROT	I	㊴	L	H	H	H	H	H	H	H	H	L	H	H
CAP ROT	I	㊶	L	L	L	H	H	H	H	H	H	L	L	L
RESET 194	O	㊷	L	L	L	L	L	L	L	L	L	L	L	L
CAP CUT	O	㊸	L	L	L	L	L	L	L	L	L	L	L	L
PB + REC 2 *1	O	㊹	L	L	L	H	H	L	L	H	H	L	L	L
$\overline{\text{BIAS CONT 1}}$ *1	O	㊺	L	L	L	L	L	L	L	H	H	L	L	L
$\overline{\text{CUE/REV}}$	O	㊼	H	H	H	H	H	L	L	H	H	H	H	H
$\overline{\text{CAP RVS}}$	O	㊾	H	H	H	H	H	H	L	H	H	H	H	H
WITHN/$\overline{\text{N.LESS}}$	I	㊿	H	H	H	H	H	H	H	H	H	H	H	H
$\overline{\text{REC}\cdot\overline{\text{P}}}$	O	(51)	H	H	H	H	H	H	H	L	H	H	H	H
CAP STOP	O	(52)	H	H	H	L	L	L	L	L	L	H	H	H
$\overline{\text{PAUSE}}$	O	(56)	H	H	H	H	L	H	H	H	L	*2	H	H
VD/CTL	I	(67)	L	PB CTL	PB CTL	PB CTL	L	PB CTL	PB CTL	VD	L	L	PB CTL	PB CTL
RF SW P	I	(69)	H/L	RF SWP	RF SWP	RF SWP	RF SWP	RF SWP	RF SWP	RF SWP	RF SWP	H/L	RF SWP	RF SWP
NOISE P *1	I	(75)	L	L	L	L	L	L	L	L	L	L	L	L

*1 : NOT USED
*2 : T=2(SEC),
50% duty ratio pulse

[SYSTEM CONTROL-REEL MOTOR BLOCK INTERFACE]

SIGNAL	I/O	IC601 Pin No.	EJECTED	LOADING	THREADING	STOP	UN-THREADING	UN-LOADING	FF	REW	PB	PB PAUSE	PICTURE SEARCH		REC	REC PAUSE	FR SEARCH	
													CUE	REV			CUE	REV
$\overline{\text{CUE/REV}}$	O	㊼	H	H	H	H	H	H	H	H	H	H	L	L	H	H	H	H
$\overline{\text{REEL FWD}}$	O	㊽	L	L	L	L	H	L	L	H	L	L	L	H	L	L	L	H
REEL STOP	O	(54)	H	H	L	H	L	H	L	L	L	H	L	L	L	H	L	L
F/R	O	(57)	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H
PB + REC 1	O	(58)	L	L	L	L	L	L	L	L	H	H	L	L	H	H	L	L
$\overline{\text{UNLOAD}}$	O	(53)	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H

[SYSTEM CONTROL-MECHANISM BLOCK INTERFACE]

SIGNAL	I/O	IC601 Pin No.	EJECTED	LOADING	THREADING	STOP	UN-THREADING	UN-LOADING	FF	REW	PB	PB PAUSE	PICTURE SEARCH		REC	REC PAUSE	FR SEARCH	
													CUE	REV			CUE	REV
M SW *[1]	I	⑮	5V	3V	1V (2V)	0V	1V (2V)	3V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V
TOP/$\overline{\text{END}}$	O	㉔	L	L	L	L	H	H	L	H	L	L	L	H	L	L	L	H
$\overline{\text{END SENS}}$	I	㉕	H	H/L	H/L	H	H	L	H	H	H	H	H	H	H	H	H	H
UNLOAD	O	㉖	L	L	L	L	H	H	L	L	L	L	L	L	L	L	L	L
LOAD	O	㉗	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L
UNBRK (H)	O	㉚	L	L	L	L	L	L	H	H	H	L	H	H	H	L	H	H
UNBRK (S)	O	㉛	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
PINCH (S)	O	㉜	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
PINCH (H)	O	㉟	L	H	L	L	L	H	L	L	H	L	H	H	H	L	L	L

*[1] (   ) : THE SAFTY TAB OF THE CASSETTE IS BROKEN

[SYSTEM CONTROL-AUDIO BLOCK INTERFACE]

SIGNAL	I/O	IC601 Pin No.	MODE											
			STOP	FF	REW	PB	PB-PAUSE	PICTURE SEARCH		REC OR TIMER REC	REC-PAUSE	WAIT PAUSE	FR SEARCH	
								CUE	REV				CUE	REV
AUDIO DUB *[1]	O	④	L	L	L	L	L	L	L	L	L	L	L	L
A MUTE	O	⑤	L	L	L	L	H	H	H	L	L	L	H	H
BIAS CONT 2	O	(55)	L	L	L	L	L	L	L	H	L	L	L	L
PB + AUDIO DUB	O	(78)	L	L	L	H	H	H	H	L	L	L	H	H

*[1] NOT USED

[SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE]

SIGNAL	I/O	IC601 Pin No.	MODE									
			USUAL	PRESSED BUTTON								
				EJECT	STOP	PB	REC		REW	FF	PAUSE	POWER
F SW 1	I	⑬	5V	0V	1V	2V	3V		–	–	–	–
F SW 2	I	⑭	5V	–	–	–	–		0V	1V	2V	–
V HOLD *1	I	⑯	0V – 5V *2	–	–	–	–		–	–	–	–
$\overline{\text{POWER ON/OFF}}$	I	⑰	5V	–	–	–	–		–	–	–	0V
$\overline{\text{IR}}$	I	(66) , (68)	5V	–	–	–	–		–	–	–	–

*1 : NOT USED
*2 : BY V HOLD VR

[SYSTEM CONTROL-TIMER BLOCK INTERFACE]

SIGNAL	I/O	IC601 Pin No.	MODE
			USUAL
S DATA ST	O	(63)	L
S DATA TS	I	(64)	L
$\overline{\text{S CLK}}$	I	(65)	H
$\overline{\text{SYS REQ}}$	O	(72)	H
$\overline{\text{SEND REQ}}$	I	(74)	H

[TIMER-TUNER INTERFACE (1)]

SIGNAL	I/O	IC001 Pin No.	FL DISPLAY INDICATION		
			PROG. No.	AU	BLANK
P00	I	①	*1	L	L
P01	I	②	*1	L	L
P02	I	③	*1	L	L
P03	I	④	*1	L	L
P10	I	⑤	*1	L	L
P11	I	⑥	*1	L	L
$\overline{\text{PR RESET}}$	O	(58)	H	H	H
$\overline{\text{PR UP}}$	O	(59)	H	H	H
PR LOCK	O	(60)	L	L	L
TU SEL	O	(61)	H	L	L

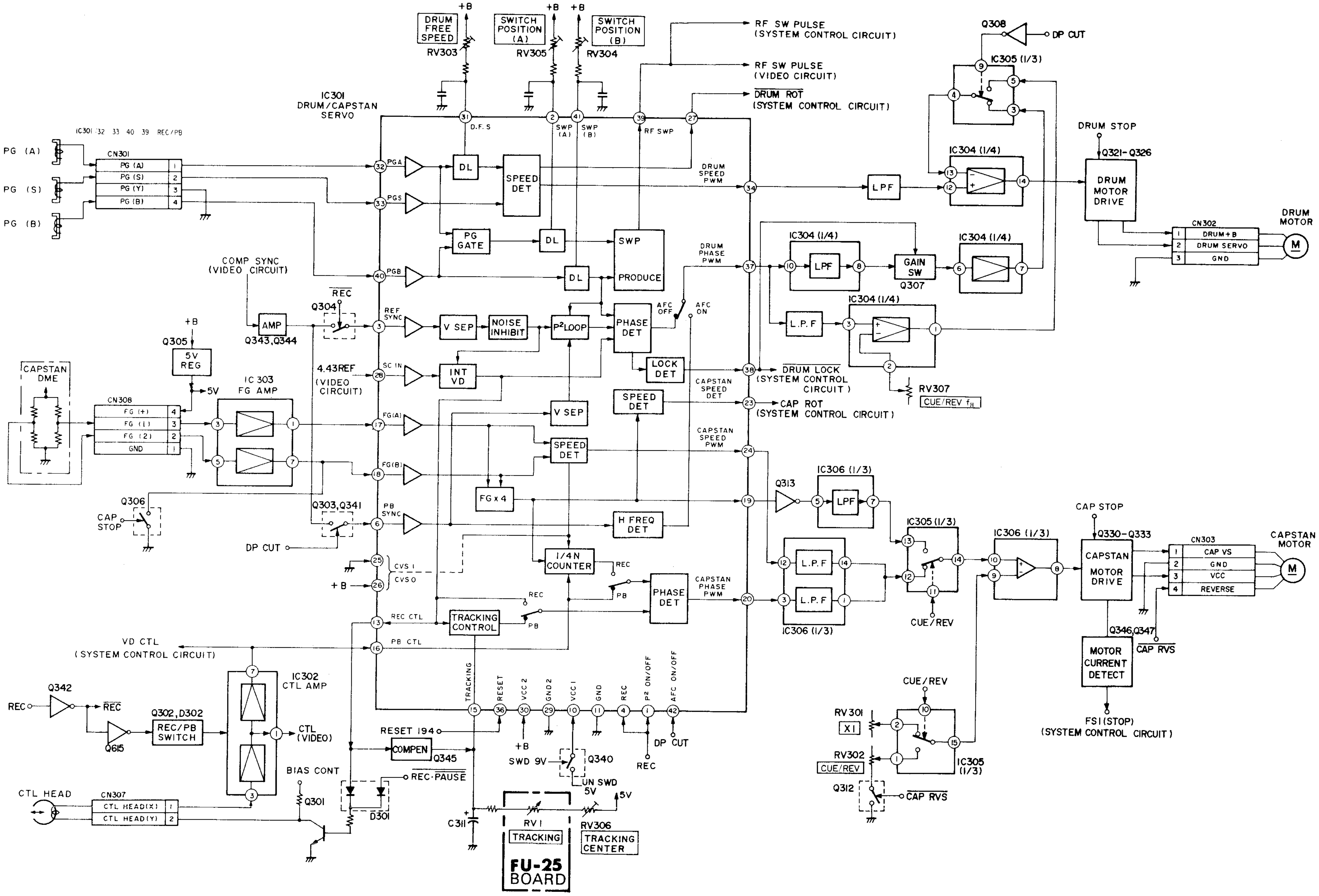
*1 REFER TO "TIMER–TUNER INTERFACE (2)".

[SYSTEM CONTROL-TIMER/TUNER (2) BLOCK INTERFACE]

	IC001 INPUT						IC001 OUTPUT (INDICATION)			IC001 INPUT						IC001 OUTPUT (INDICATION)	
PROG. No.	P11	P10	P03	P02	P01	P00	10 digit	1 digit	PROG. No.	P11	P10	P03	P02	P01	P00	10 digit	1 digit
1	H	H	L	L	L	H		1	18*2	L	H	H	L	L	L	1	8
2	H	H	L	L	H	L		2	19*2	L	H	H	L	L	H	1	9
3	H	H	L	L	H	H		3	20*2	H	L	L	L	L	L	2	0
4	H	H	L	H	L	L		4	21*2	H	L	L	L	L	H	2	1
5	H	H	L	H	L	H		5	22*2	H	L	L	L	H	L	2	2
6	H	H	L	H	H	L		6	23*2	H	L	L	L	H	H	2	3
7	H	H	L	H	H	H		7	24*2	H	L	L	H	L	L	2	4
8	H	H	H	L	L	L		8	25*2	H	L	L	H	L	H	2	5
9	H	H	H	L	L	H		9	26*2	H	L	L	H	H	L	2	6
10	L	H	L	L	L	L	1	0	27*2	H	L	L	H	H	H	2	7
11	L	H	L	L	L	H	1	1	28*2	H	L	H	L	L	L	2	8
12	L	H	L	L	H	L	1	2	29*2	H	L	H	L	L	H	2	9
13*2	L	H	L	L	H	H	1	3	0*2	H	H	L	L	L	L		0
14*2	L	H	L	H	L	L	1	4	LINE	L	L	H	H	L	L	A	U
15*2	L	H	L	H	L	H	1	5	BLANK	H	H	H	H	H	H		
16*2	L	H	L	H	H	L	1	6	1–*2	L	H	H	H	H	H	1	
17*2	L	H	L	H	H	H	1	7	2–*2	H	L	H	H	H	H	2	

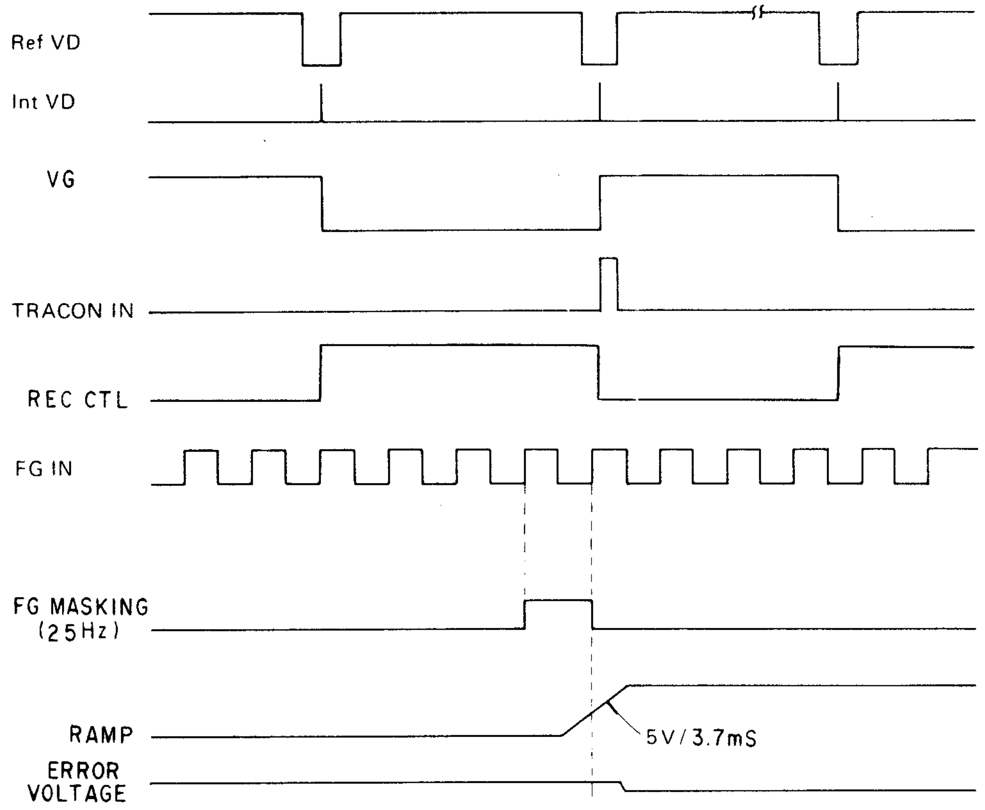
*2 NOT USED

3-6. SERVO BLOCK DIAGRAM

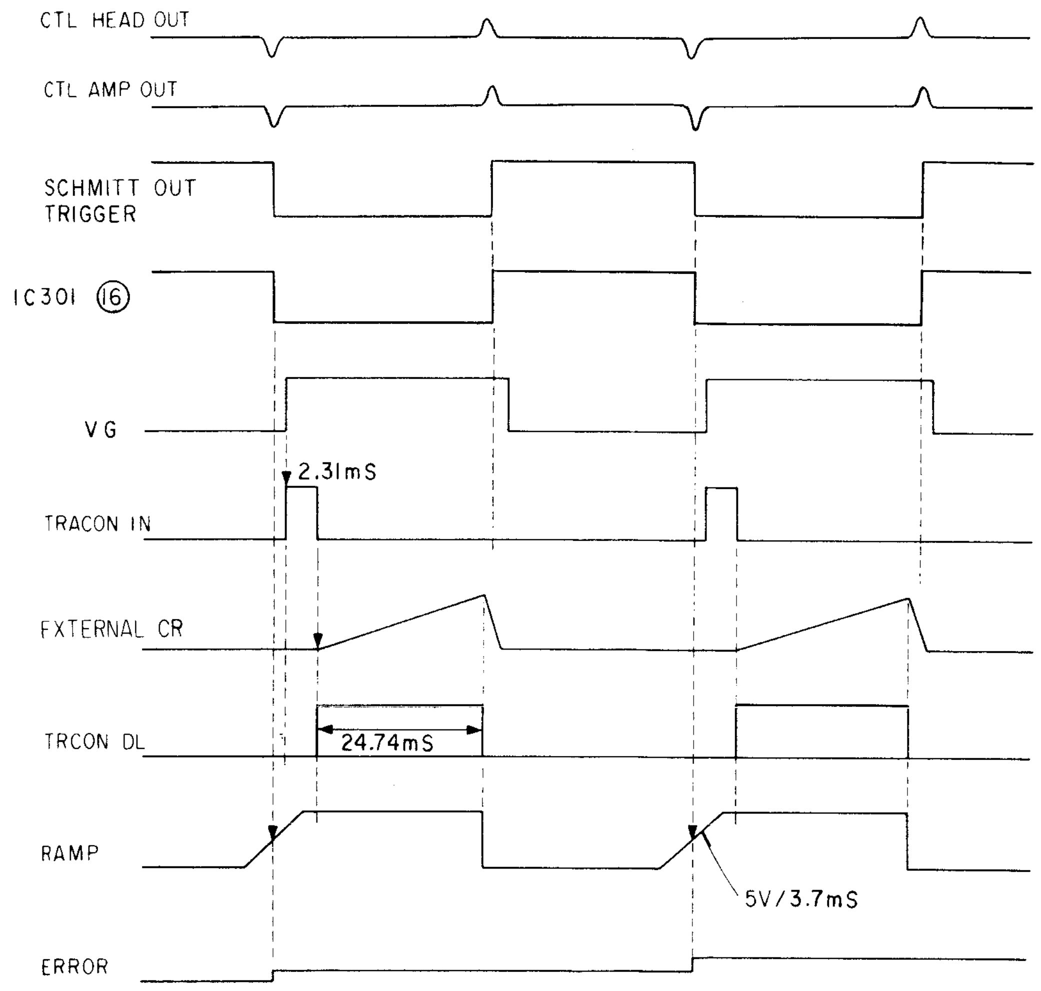


PG (A)
PG (S)
PG (B)
IC301 32 33 40 39 REC/PB
CN301
PG (A) 1
PG (S) 2
PG (Y) 3
PG (B) 4
DRUM FREE SPEED
RV303
SWITCH POSITION (A)
RV305
SWITCH POSITION (B)
RV304
+B
IC301 DRUM/CAPSTAN SERVO
D.F.S
SWP (A)
SWP (B)
RF SWP
RF SW PULSE (SYSTEM CONTROL CIRCUIT)
RF SW PULSE (VIDEO CIRCUIT)
DRUM ROT (SYSTEM CONTROL CIRCUIT)
PGA
PGS
PGB
DL
SPEED DET
PG GATE
SWP
PRODUCE
DRUM SPEED PWM
DRUM PHASE PWM
COMP SYNC (VIDEO CIRCUIT)
AMP
Q343,Q344
REC
Q304
REF SYNC
V SEP
NOISE INHIBIT
P² LOOP
PHASE DET
AFC OFF
AFC ON
LOCK DET
+B
Q305
5V REG
5V
CAPSTAN DME
CN308
FG (+) 4
FG (1) 3
FG (2) 2
GND 1
IC 303 FG AMP
4.43REF (VIDEO CIRCUIT)
SC IN
INT VD
V SEP
SPEED DET
FG(A)
FG(B)
SPEED DET
CAPSTAN SPEED DET
CAPSTAN SPEED PWM
FG x 4
Q306
CAP STOP
Q303,Q341
PB SYNC
DP CUT
H FREQ DET
CVS I
CVS O
+B
1/4N COUNTER
REC
PB
PHASE DET
CAPSTAN PHASE PWM
REC CTL
TRACKING CONTROL
PB CTL
VD CTL (SYSTEM CONTROL CIRCUIT)
TRACKING
RESET
VCC 2
GND 2
VCC 1
GND
REC
P² ON/OFF
AFC ON/OFF
DP CUT
REC
Q342
REC
Q302,D302
REC/PB SWITCH
Q615
IC302 CTL AMP
CTL (VIDEO)
BIAS CONT
Q301
CTL HEAD
CN307
CTL HEAD(X) 1
CTL HEAD(Y) 2
RESET 194
COMPEN
Q345
REC·PAUSE
D301
+B
SWD 9V
Q340
UN SWD 5V
5V
C311
RV1 TRACKING
FU-25 BOARD
RV306 TRACKING CENTER
Q308
DP CUT
IC305 (1/3)
IC304 (1/4)
LPF
DRUM STOP
Q321-Q326
DRUM MOTOR DRIVE
CN302
DRUM+B 1
DRUM SERVO 2
GND 3
DRUM MOTOR
M
IC304 (1/4)
LPF
GAIN SW
Q307
IC304 (1/4)
IC304 (1/4)
L.P.F
DRUM LOCK (SYSTEM CONTROL CIRCUIT)
RV307
CUE/REV f_H
CAP ROT (SYSTEM CONTROL CIRCUIT)
Q313
IC306 (1/3)
LPF
IC305 (1/3)
L.P.F
L.P.F
IC306 (1/3)
CUE/REV
IC306 (1/3)
CAP STOP
Q330-Q333
CAPSTAN MOTOR DRIVE
CN303
CAP VS 1
GND 2
VCC 3
REVERSE 4
CAPSTAN MOTOR
M
Q346,Q347
CAP RVS
MOTOR CURRENT DETECT
FS1 (STOP) (SYSTEM CONTROL CIRCUIT)
CUE/REV
RV301
X1
RV302
CUE/REV
IC305 (1/3)
Q312
CAP RVS

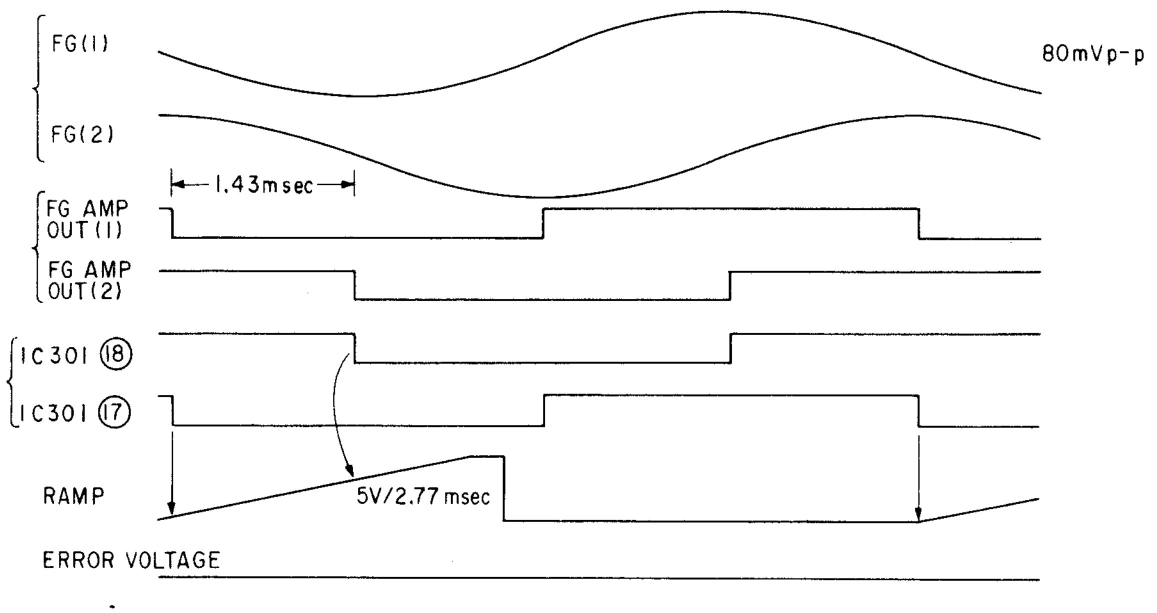
3-7. CAPSTAN PHASE SYSTEM TIMING CHART (REC)


Ref VD
Int VD
VG
TRACON IN
REC CTL
FG IN
FG MASKING (25Hz)
RAMP
5V/3.7mS
ERROR VOLTAGE

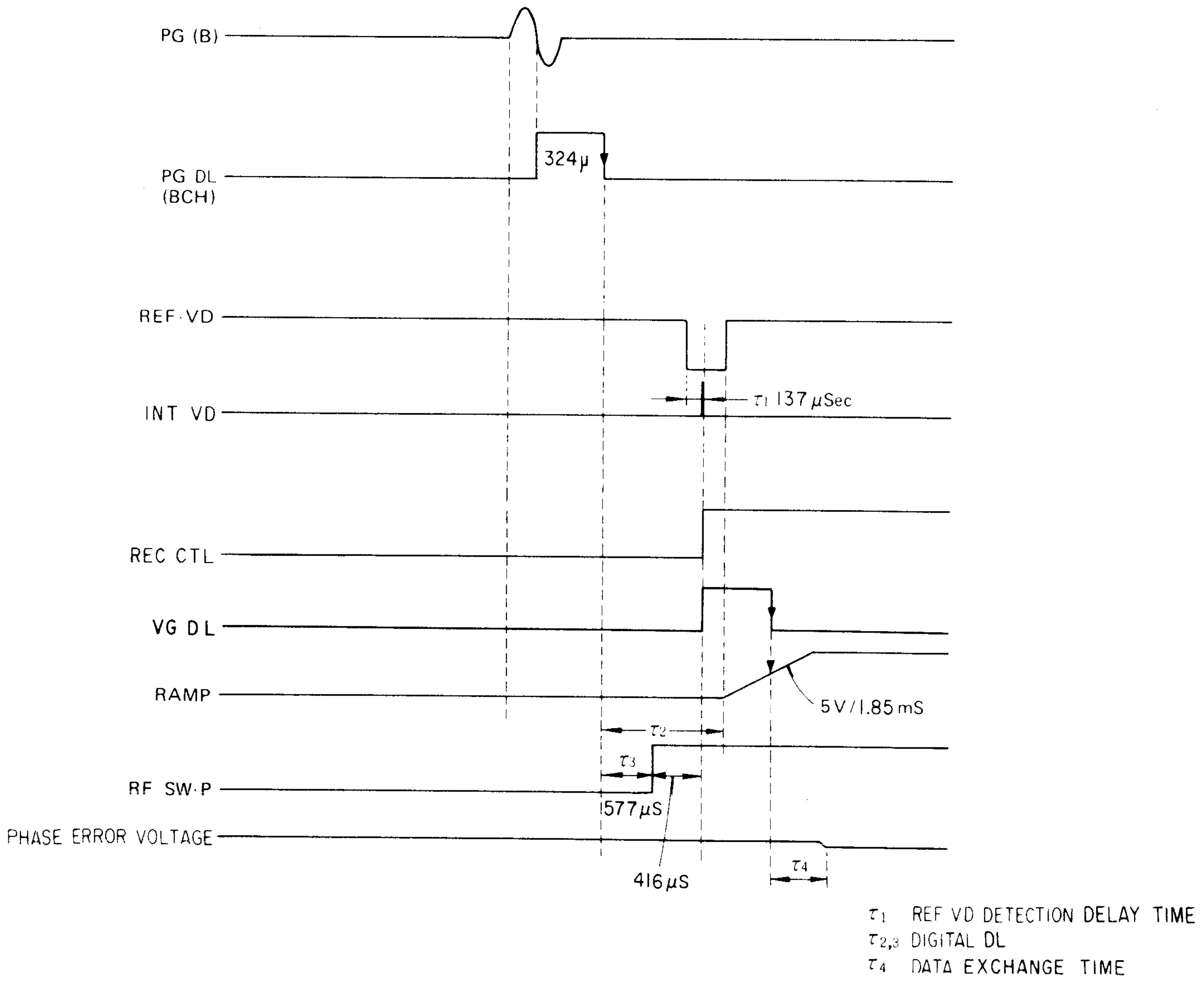
3-8. CAPSTAN PHASE SYSTEM TIMING CHART (PB)


CTL HEAD OUT
CTL AMP OUT
SCHMITT OUT TRIGGER
IC301 ⑯
VG
2.31mS
TRACON IN
FXTERNAL CR
TRCON DL
24.74mS
RAMP
5V/3.7mS
ERROR

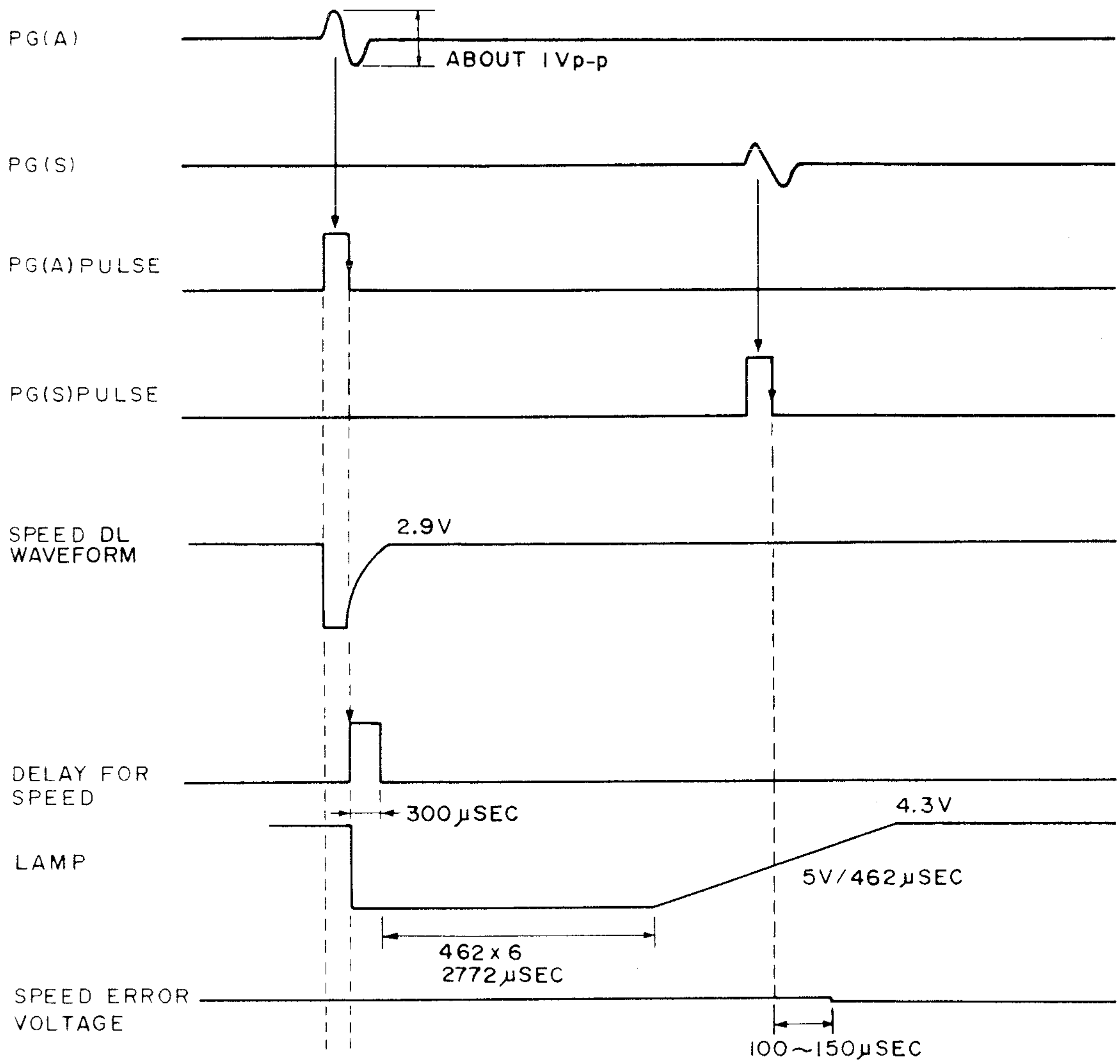
3-9. CAPSTAN SPEED SYSTEM TIMING CHART


FG(1)
FG(2)
80mVp-p
1.43msec
FG AMP OUT(1)
FG AMP OUT(2)
IC301 ⑱
IC301 ⑰
RAMP
5V/2.77msec
ERROR VOLTAGE

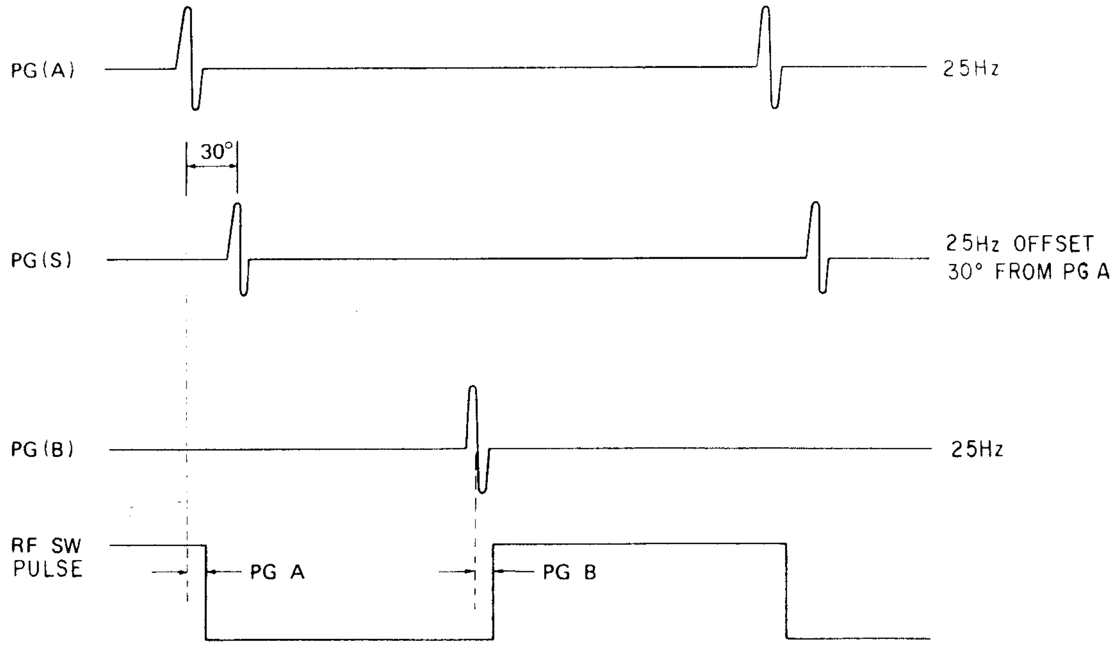
3-10. DRUM PHASE SYSTEM TIMING CHART


PG (B)
324μ
PG DL (BCH)
REF·VD
INT VD
τ1 137μSec
REC CTL
VG DL
RAMP
5V/1.85mS
τ2
τ3
RF SW·P
577μS
416μS
PHASE ERROR VOLTAGE
τ4
τ1 REF VD DETECTION DELAY TIME
τ2,3 DIGITAL DL
τ4 DATA EXCHANGE TIME

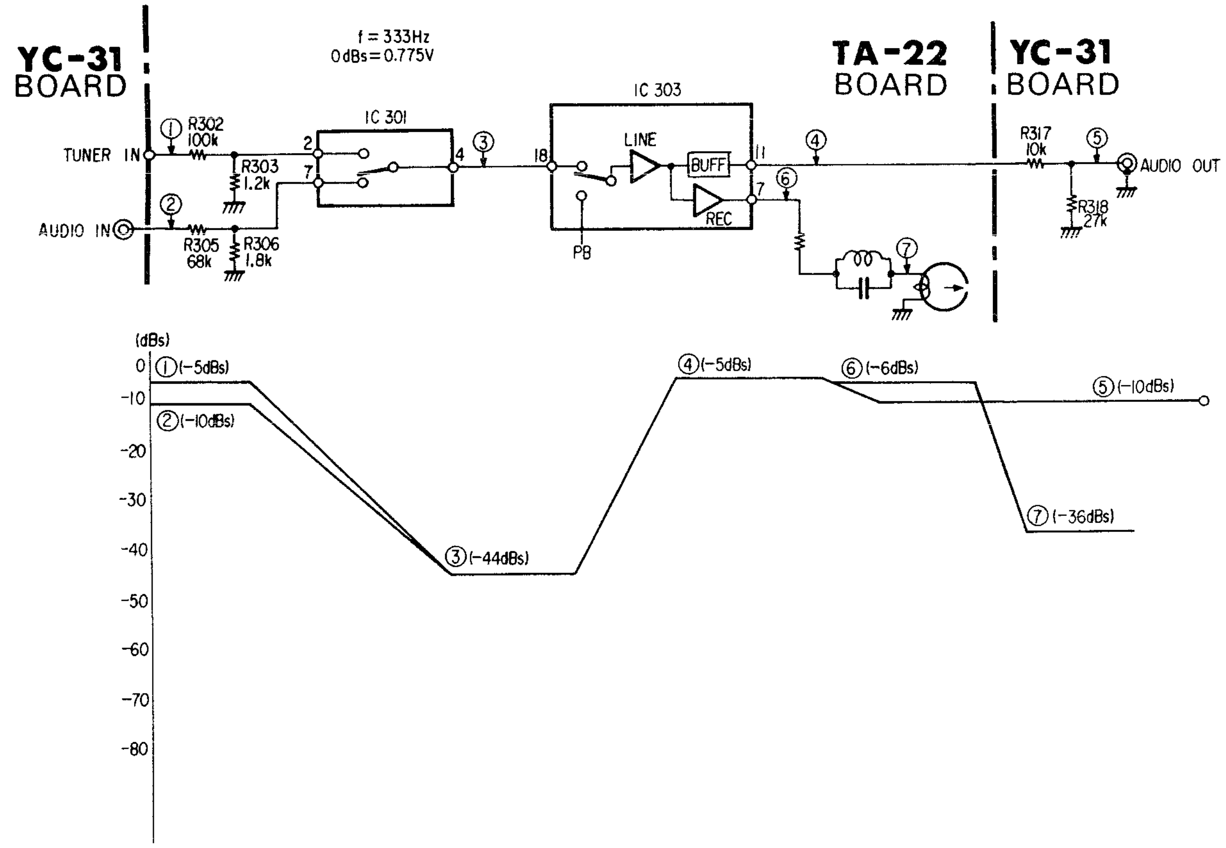
3-11. DRUM SPEED SYSTEM TIMING CHART


PG(A)
ABOUT 1Vp-p
PG(S)
PG(A)PULSE
PG(S)PULSE
SPEED DL WAVEFORM
2.9V
DELAY FOR SPEED
300μSEC
4.3V
LAMP
5V/462μSEC
462 x 6
2772μSEC
SPEED ERROR VOLTAGE
100~150μSEC

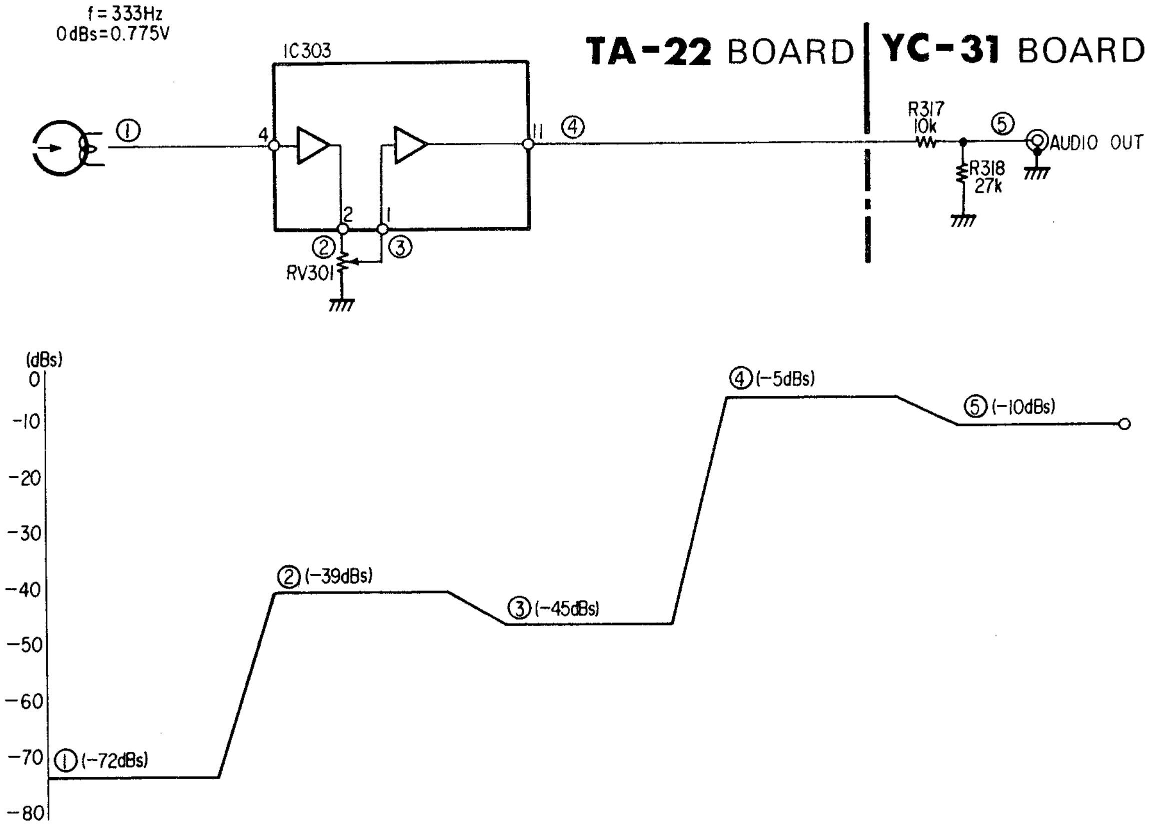
3-12. PG SIGNAL TIMING CHART


PG(A)
25Hz
30°
PG(S)
25Hz OFFSET 30° FROM PG A
PG(B)
25Hz
RF SW PULSE
PG A
PG B

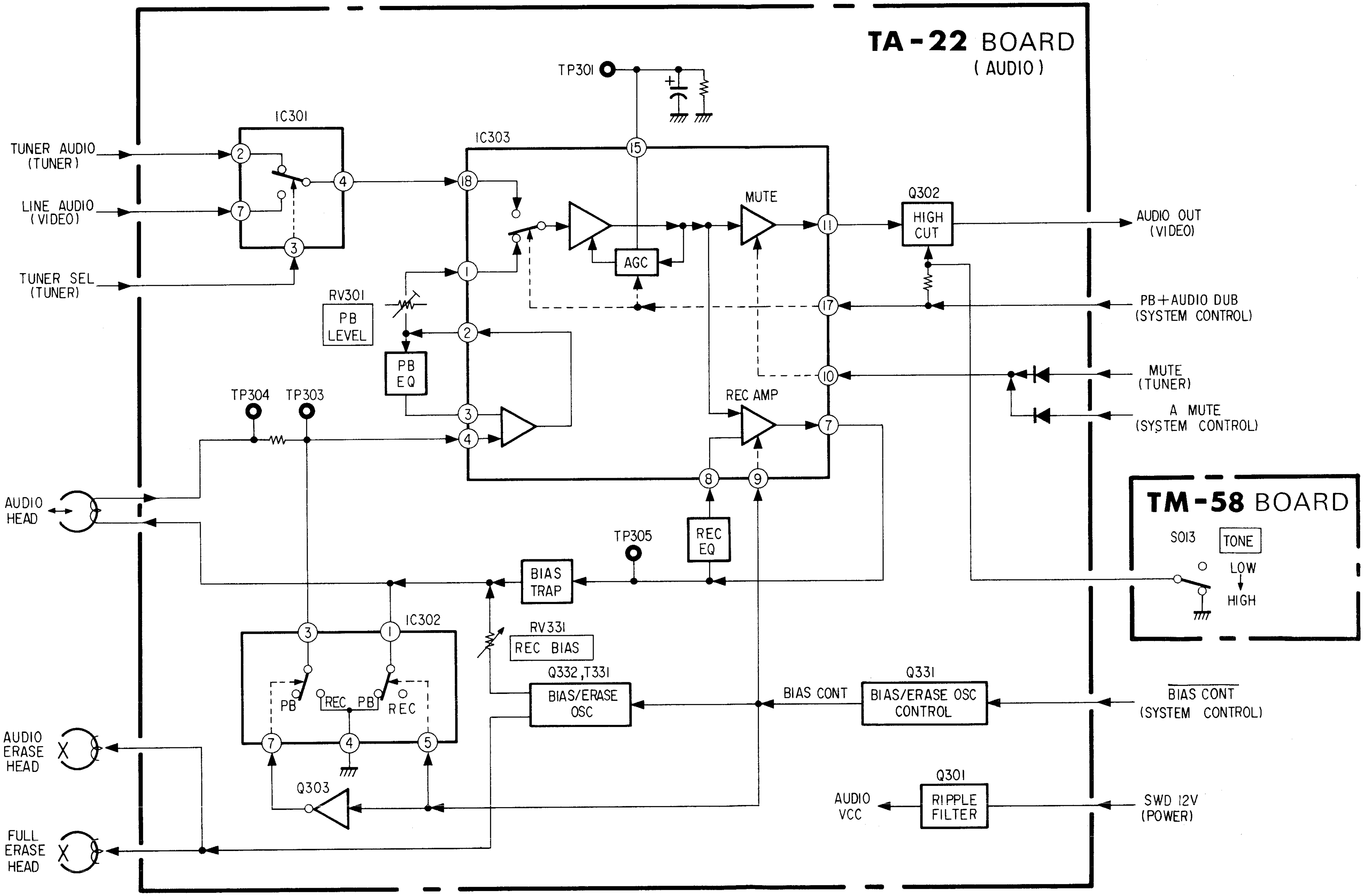
3-13. AUDIO LEVEL DIAGRAM (REC)



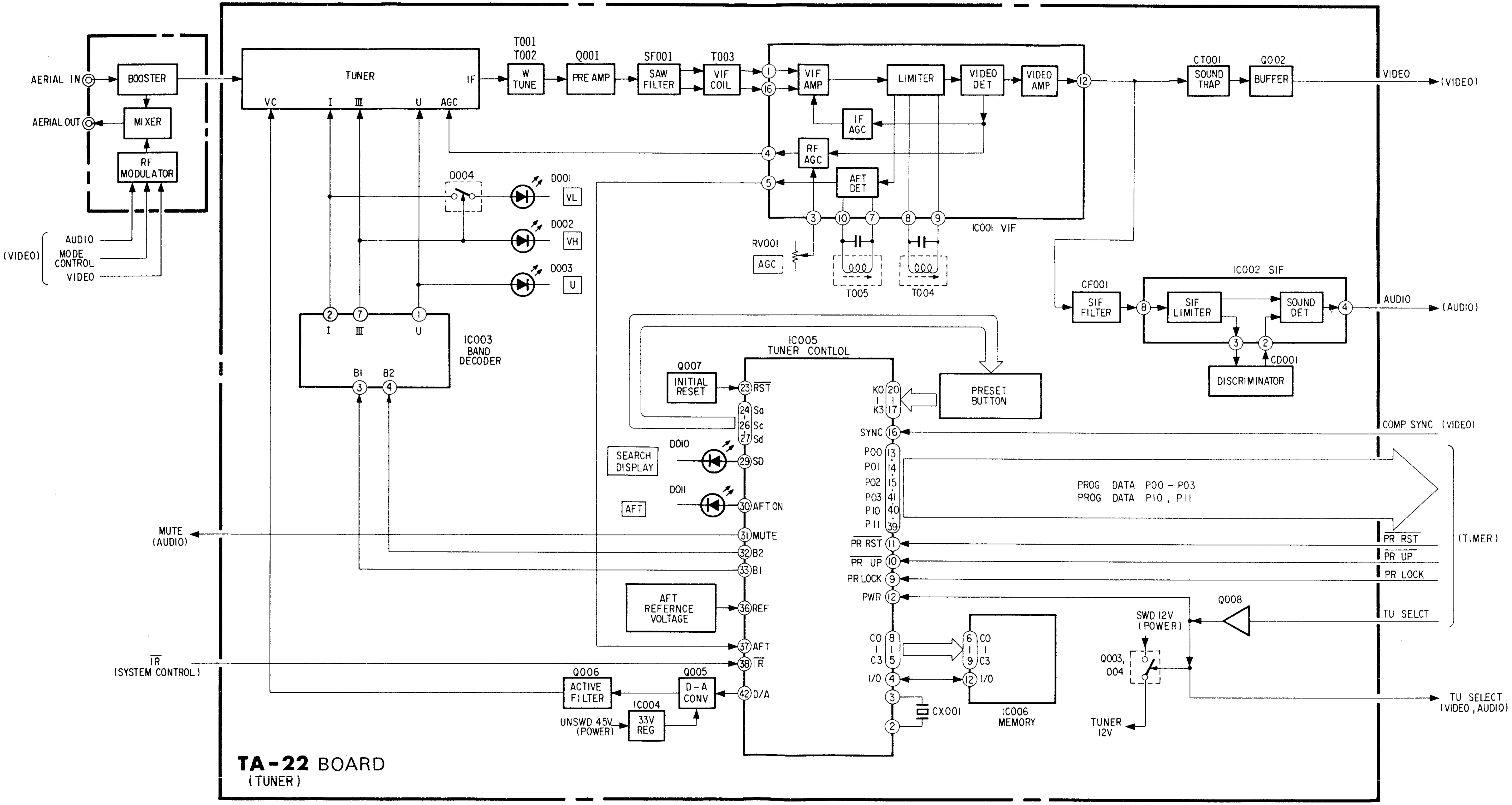
3-14. AUDIO LEVEL DIAGRAM (PB)



3-15. AUDIO BLOCK DIAGRAM

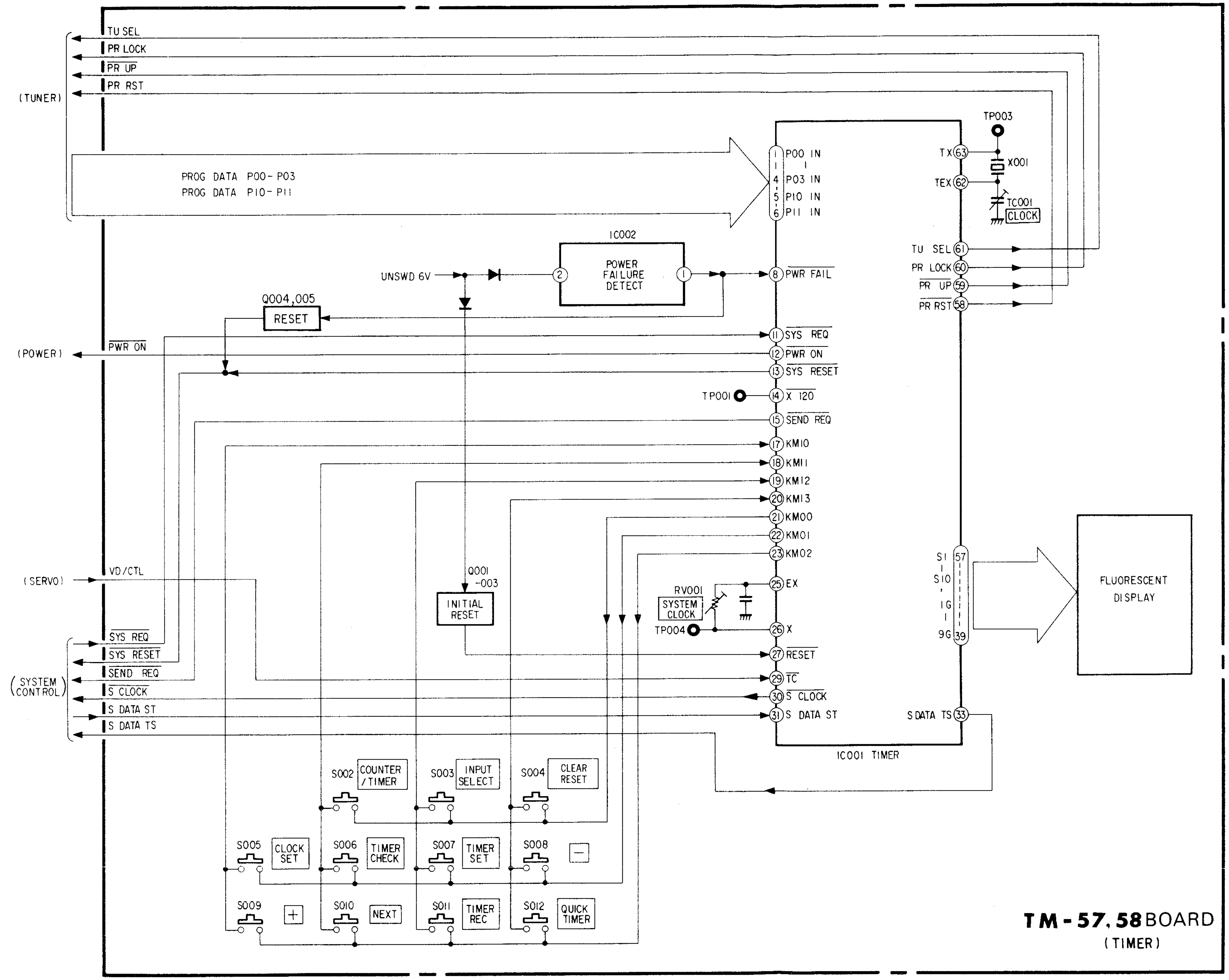

TA-22 BOARD
(AUDIO)
TP301
IC301
IC303
TUNER AUDIO
(TUNER)
LINE AUDIO
(VIDEO)
TUNER SEL
(TUNER)
2
7
3
4
18
15
1
2
3
4
MUTE
AGC
11
17
10
7
8
9
Q302
HIGH CUT
AUDIO OUT
(VIDEO)
PB+AUDIO DUB
(SYSTEM CONTROL)
MUTE
(TUNER)
A MUTE
(SYSTEM CONTROL)
RV301
PB LEVEL
PB EQ
TP304
TP303
REC AMP
AUDIO HEAD
TP305
REC EQ
BIAS TRAP
TM-58 BOARD
S013
TONE
LOW
HIGH
IC302
3
1
PB
REC
PB
REC
7
4
5
RV331
REC BIAS
Q332, T331
BIAS/ERASE OSC
BIAS CONT
Q331
BIAS/ERASE OSC CONTROL
BIAS CONT
(SYSTEM CONTROL)
AUDIO ERASE HEAD
Q303
Q301
AUDIO VCC
RIPPLE FILTER
SWD 12V
(POWER)
FULL ERASE HEAD

3-16. TUNER BLOCK DIAGRAM



AERIAL IN
AERIAL OUT
BOOSTER
MIXER
RF MODULATOR
(VIDEO)
AUDIO
MODE CONTROL
VIDEO
TUNER
IF
VC
I
III
U
AGC
T001
T002
W TUNE
Q001
PRE AMP
SF001
SAW FILTER
T003
VIF COIL
VIF AMP
LIMITER
VIDEO DET
VIDEO AMP
IF AGC
RF AGC
AFT DET
IC001 VIF
RV001
AGC
T005
T004
CT001
SOUND TRAP
Q002
BUFFER
VIDEO
(VIDEO)
D004
D001
VL
D002
VH
D003
U
IC003 BAND DECODER
B1
B2
CF001
SIF FILTER
IC002 SIF
SIF LIMITER
SOUND DET
DISCRIMINATOR
CD001
AUDIO
(AUDIO)
IC005 TUNER CONTLOL
Q007
INITIAL RESET
RST
Sa
Sc
Sd
SEARCH DISPLAY
D010
SD
D011
AFT
AFT ON
MUTE (AUDIO)
MUTE
B2
B1
AFT REFERNCE VOLTAGE
REF
AFT
IR (SYSTEM CONTROL)
IR
Q006
ACTIVE FILTER
Q005
D-A CONV
IC004
33V REG
UNSWD 45V (POWER)
D/A
PRESET BUTTON
K0 – K3
SYNC
COMP SYNC (VIDEO)
P00
P01
P02
P03
P10
P11
PROG DATA P00 - P03
PROG DATA P10 , P11
PR RST
PR UP
PR LOCK
PWR
(TIMER)
TU SELCT
Q008
SWD 12V (POWER)
Q003, 004
TUNER 12V
TU SELECT (VIDEO, AUDIO)
C0 – C3
I/O
IC006 MEMORY
CX001
TA-22 BOARD (TUNER)

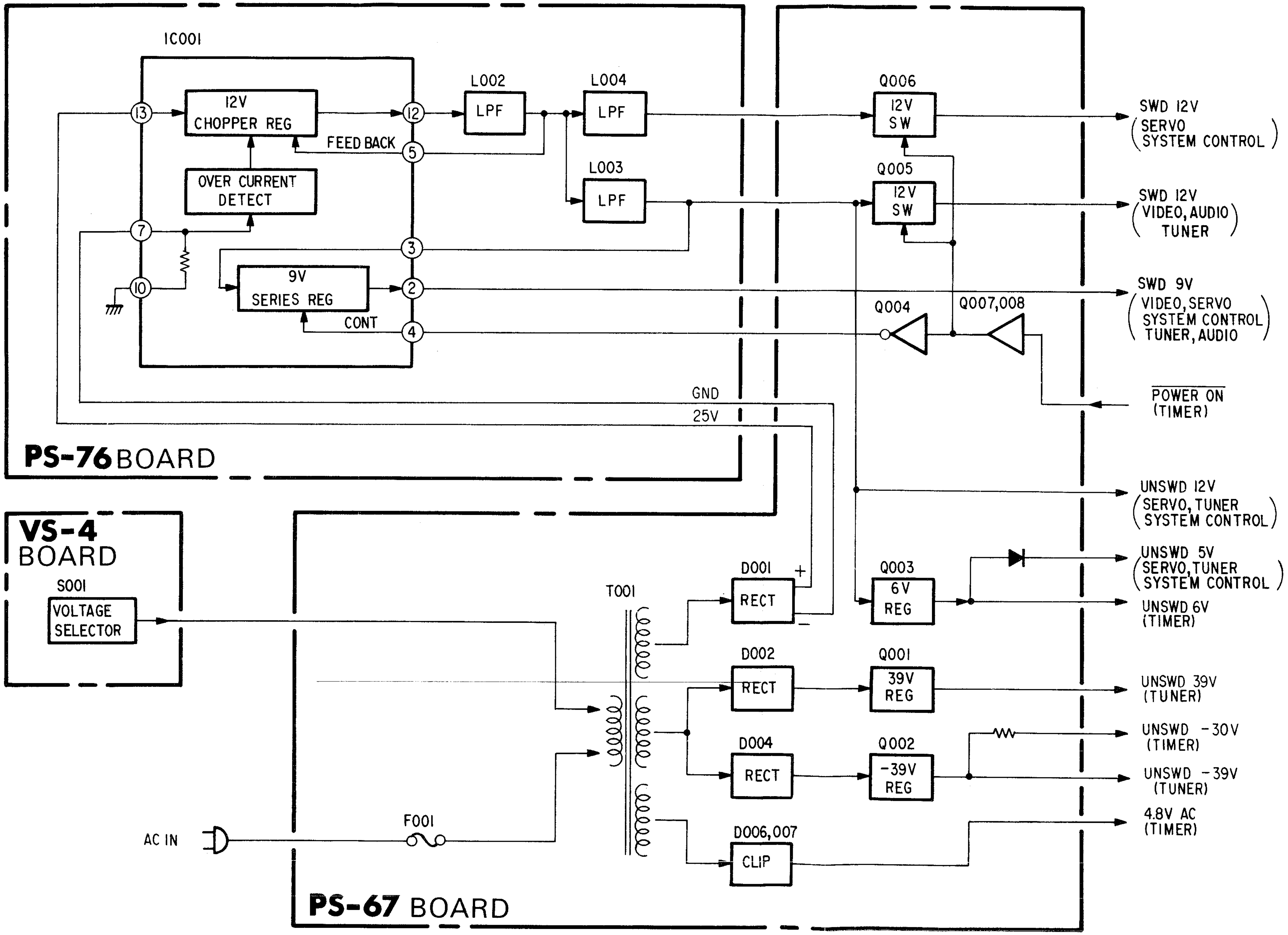
3-17. TIMER BLOCK DIAGRAM



(TUNER)
TU SEL
PR LOCK
PR UP
PR RST
PROG DATA P00-P03
PROG DATA P10-P11
IC002
POWER FAILURE DETECT
UNSWD 6V
Q004,005
RESET
(POWER)
PWR ON
(SERVO)
VD/CTL
Q001 -003
INITIAL RESET
(SYSTEM CONTROL)
SYS REQ
SYS RESET
SEND REQ
S CLOCK
S DATA ST
S DATA TS
P00 IN
P03 IN
P10 IN
P11 IN
PWR FAIL
SYS REQ
PWR ON
SYS RESET
TP001
X 120
SEND REQ
KMI0
KMI1
KMI2
KMI3
KM00
KM01
KM02
RV001
SYSTEM CLOCK
TP004
EX
X
RESET
TC
S CLOCK
S DATA ST
S DATA TS
IC001 TIMER
TP003
TX
TEX
X001
TC001
CLOCK
TU SEL
PR LOCK
PR UP
PR RST
S1
S10
1G
9G
FLUORESCENT DISPLAY
S002 COUNTER /TIMER
S003 INPUT SELECT
S004 CLEAR RESET
S005 CLOCK SET
S006 TIMER CHECK
S007 TIMER SET
S008 −
S009 +
S010 NEXT
S011 TIMER REC
S012 QUICK TIMER

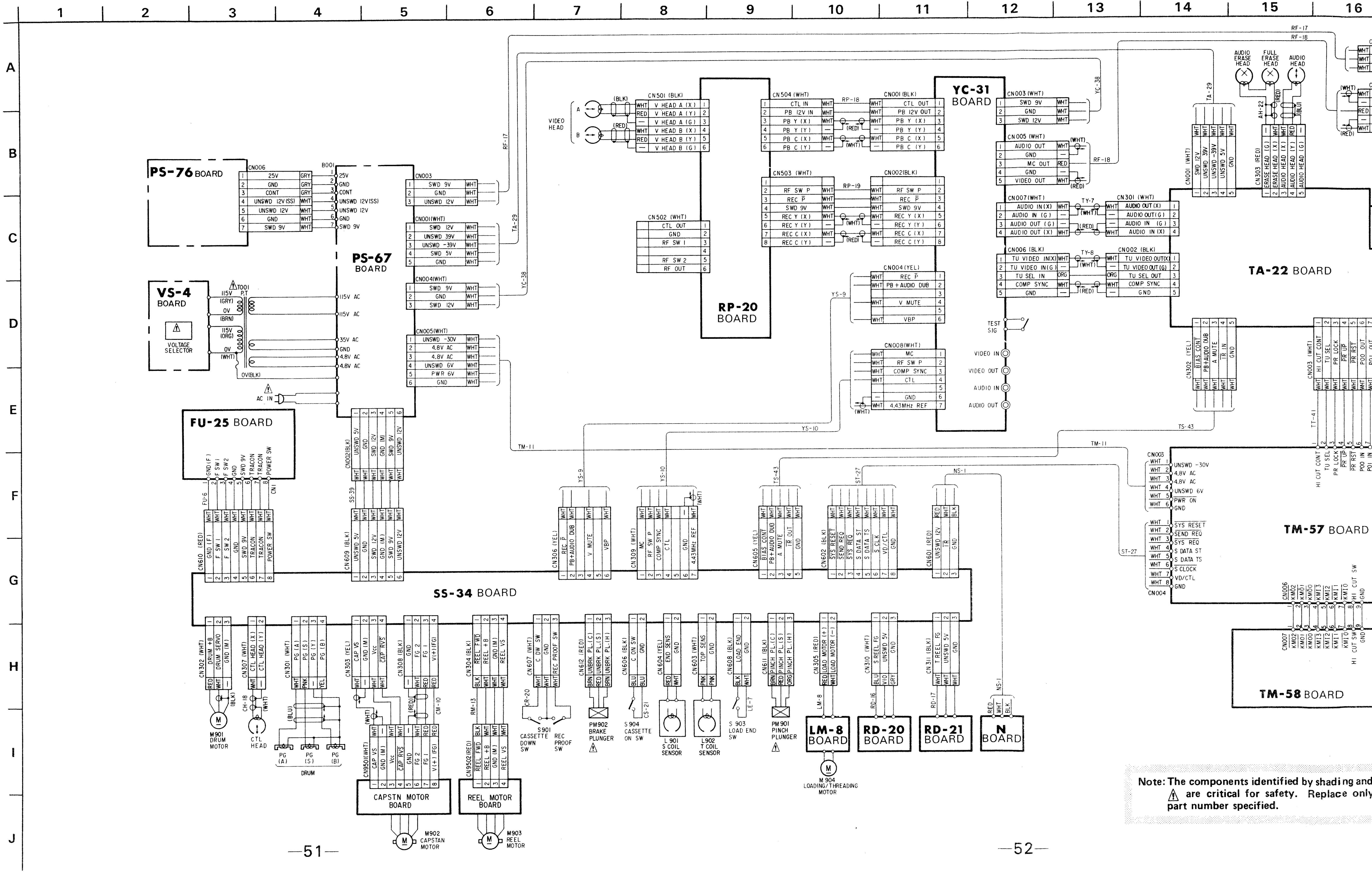
TM-57, 58 BOARD
(TIMER)

3-18. POWER BLOCK DIAGRAM

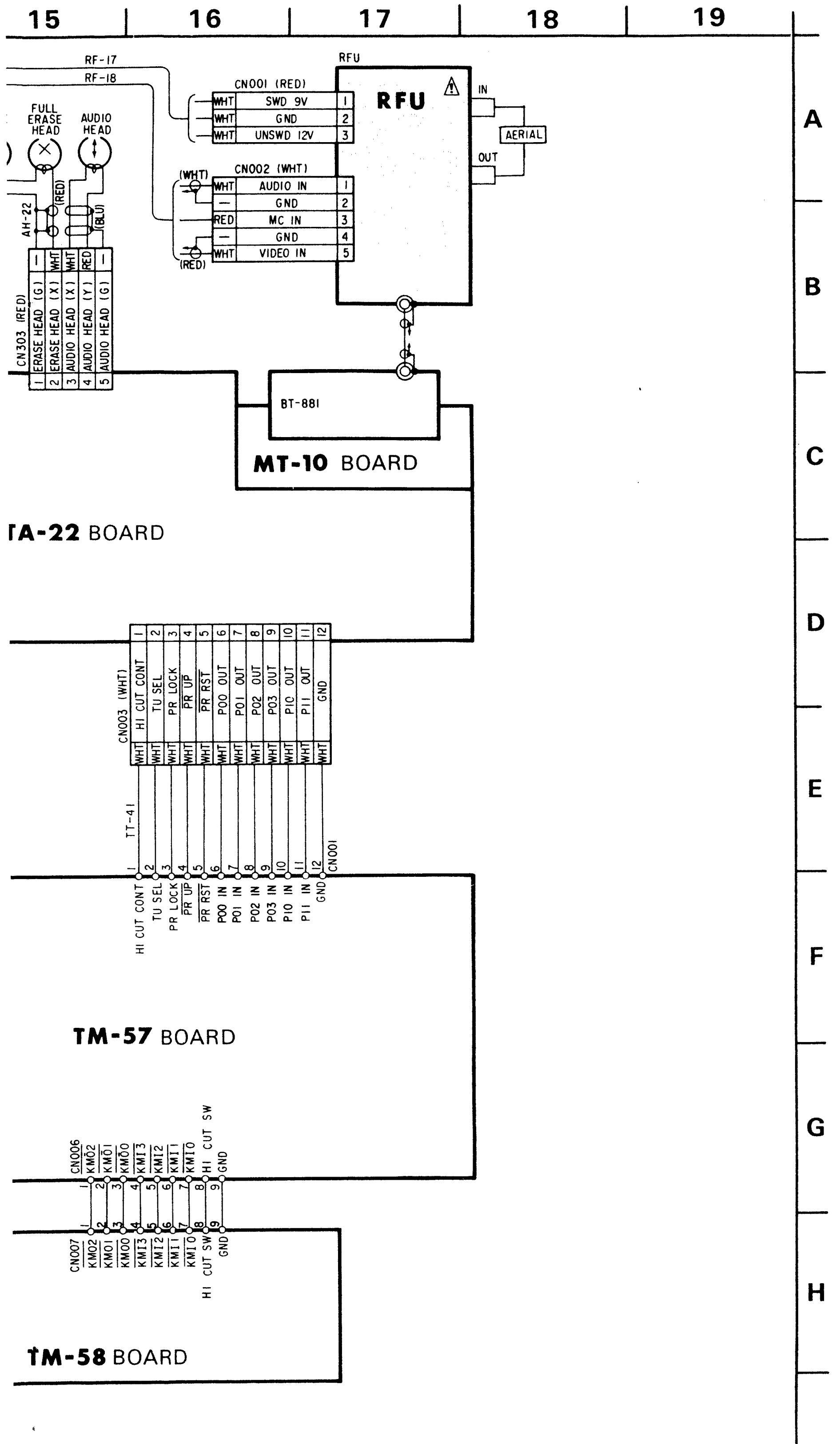

IC001
12V CHOPPER REG
OVER CURRENT DETECT
9V SERIES REG
FEED BACK
CONT
13
12
5
7
10
3
2
4
L002
LPF
L004
LPF
L003
LPF
GND
25V
PS-76 BOARD
Q006
12V SW
Q005
12V SW
Q004
Q007,008
SWD 12V (SERVO SYSTEM CONTROL)
SWD 12V (VIDEO, AUDIO TUNER)
SWD 9V (VIDEO, SERVO SYSTEM CONTROL TUNER, AUDIO)
POWER ON (TIMER)
UNSWD 12V (SERVO, TUNER SYSTEM CONTROL)
UNSWD 5V (SERVO, TUNER SYSTEM CONTROL)
UNSWD 6V (TIMER)
UNSWD 39V (TUNER)
UNSWD -30V (TIMER)
UNSWD -39V (TUNER)
4.8V AC (TIMER)
VS-4 BOARD
S001
VOLTAGE SELECTOR
T001
D001
RECT
+
−
Q003
6V REG
D002
RECT
Q001
39V REG
D004
RECT
Q002
-39V REG
D006,007
CLIP
F001
AC IN
PS-67 BOARD

SECTION 4
SCHEMATIC DIAGRAM AND PRINTED WIRING BOARDS

4-1. FRAME SCHEMATIC DIAGRAM


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I J
PS-76 BOARD
PS-67 BOARD
VS-4 BOARD
VOLTAGE SELECTOR
AC IN
FU-25 BOARD
RP-20 BOARD
YC-31 BOARD
TA-22 BOARD
TM-57 BOARD
TM-58 BOARD
SS-34 BOARD
VIDEO HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
AUDIO HEAD
TEST SIG
VIDEO IN
VIDEO OUT
AUDIO IN
AUDIO OUT
M901 DRUM MOTOR
CTL HEAD
PG (A)
PG (S)
PG (B)
DRUM
CAPSTN MOTOR BOARD
M902 CAPSTAN MOTOR
REEL MOTOR BOARD
M903 REEL MOTOR
S901 CASSETTE DOWN SW
REC PROOF SW
PM902 BRAKE PLUNGER
S904 CASSETTE ON SW
L901 S COIL SENSOR
L902 T COIL SENSOR
S903 LOAD END SW
PM901 PINCH PLUNGER
LM-8 BOARD
M904 LOADING/THREADING MOTOR
RD-20 BOARD
RD-21 BOARD
N BOARD

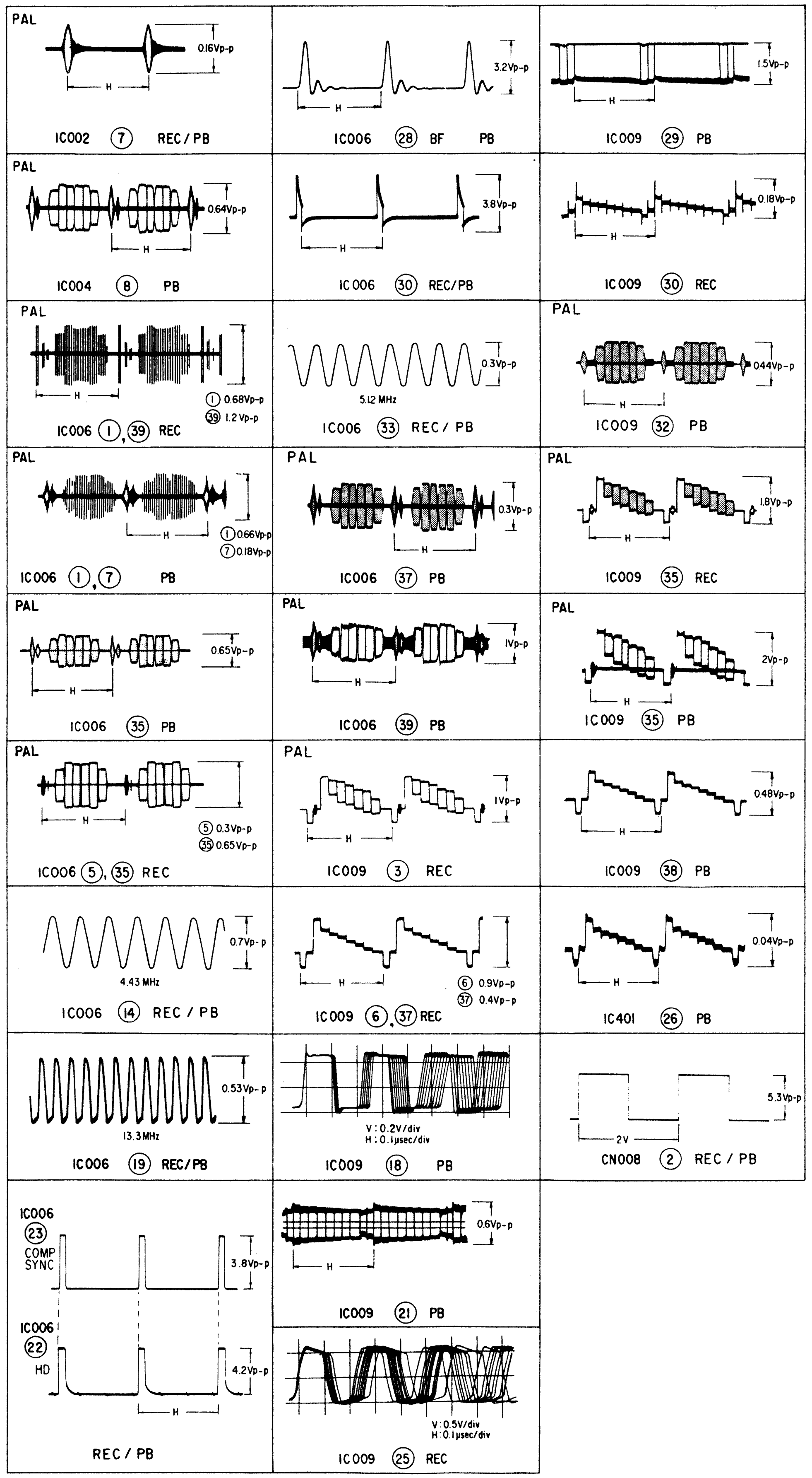
Note: The components identified by shadi ng and
⚠ are critical for safety. Replace only
part number specified.


15
16
17
18
19
RF-17
RF-18
RFU
CN001 (RED)
WHT SWD 9V 1
WHT GND 2
WHT UNSWD 12V 3
RFU
IN
OUT
AERIAL
FULL ERASE HEAD
AUDIO HEAD
(RED)
(BLU)
AH-22
CN002 (WHT)
(WHT)
WHT AUDIO IN 1
— GND 2
RED MC IN 3
— GND 4
WHT VIDEO IN 5
(RED)
CN303 (RED)
1 ERASE HEAD (G)
2 ERASE HEAD (X1)
3 AUDIO HEAD (X1)
4 AUDIO HEAD (Y)
5 AUDIO HEAD (G)
BT-881
MT-10 BOARD
TA-22 BOARD
CN003 (WHT)
HI CUT CONT
TU SEL
PR LOCK
PR UP
PR RST
P00 OUT
P01 OUT
P02 OUT
P03 OUT
P1C OUT
P11 OUT
GND
TT-41
CN001
HI CUT CONT
TU SEL
PR LOCK
PR UP
PR RST
P00 IN
P01 IN
P02 IN
P03 IN
P10 IN
P11 IN
GND
TM-57 BOARD
CN006
KM02
KM01
KM00
KMI3
KMI2
KMI1
KMI0
HI CUT SW
GND
CN007
KM02
KM01
KM00
KMI3
KMI2
KMI1
KMI0
HI CUT SW
GND
TM-58 BOARD
A
B
C
D
E
F
G
H
I
J

identified by shading and mark
or safety. Replace only with
ified.

When indicating parts by reference number, please include the board name.

YC-31 BOARD (PAL/SECAM)



IC002 ⑦ REC/PB

IC006 ㉘ BF PB

IC009 ㉙ PB

IC004 ⑧ PB

IC006 ㉚ REC/PB

IC009 ㉚ REC

IC006 ①, ㊴ REC

IC006 ㉝ REC/PB

IC009 ㉜ PB

IC006 ①, ⑦ PB

IC006 ㊲ PB

IC009 ㉟ REC

IC006 ㉟ PB

IC006 ㊴ PB

IC009 ㉟ PB

IC006 ⑤, ㉟ REC

IC009 ③ REC

IC009 ㊳ PB

IC006 ⑭ REC/PB

IC009 ⑥, ㊲ REC

IC401 ㉖ PB

IC006 ⑲ REC/PB

IC009 ⑱ PB

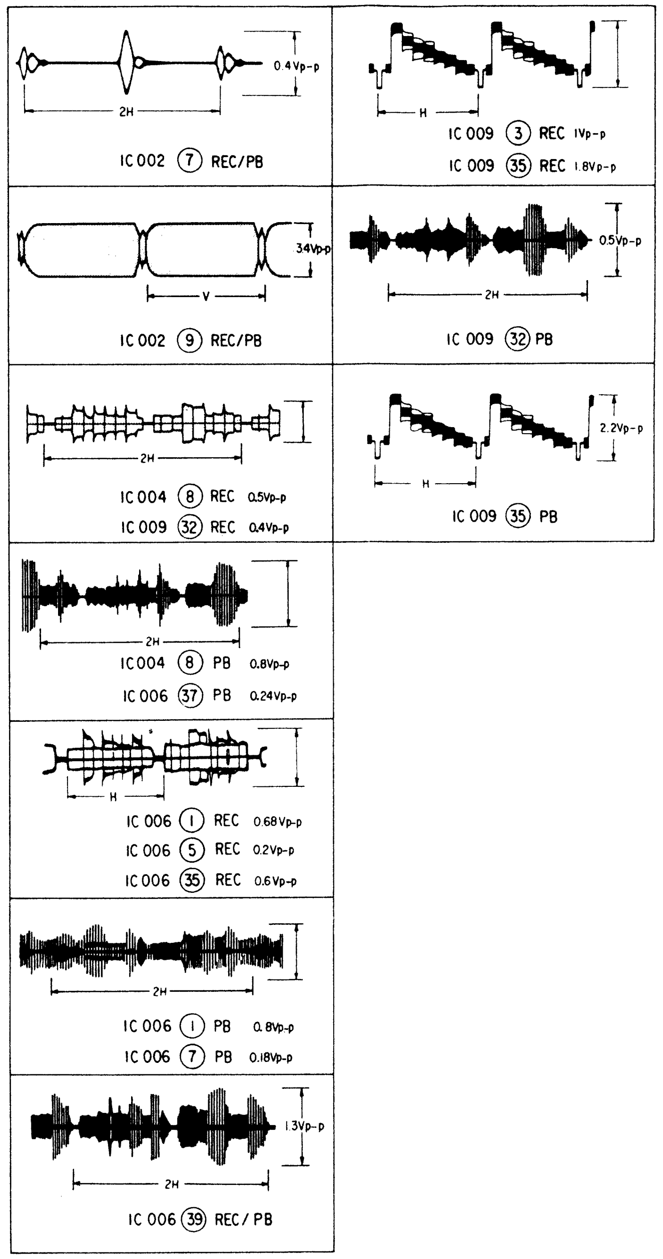
CN008 ② REC/PB

REC/PB

IC009 ㉑ PB

IC009 ㉕ REC

YC-31 BOARD (SECAM)



IC002 ⑦ REC/PB

IC009 ③ REC 1Vp-p
IC009 ㉟ REC 1.8Vp-p

IC002 ⑨ REC/PB

IC009 ㉜ PB

IC004 ⑧ REC 0.5Vp-p
IC009 ㉜ REC 0.4Vp-p

IC009 ㉟ PB

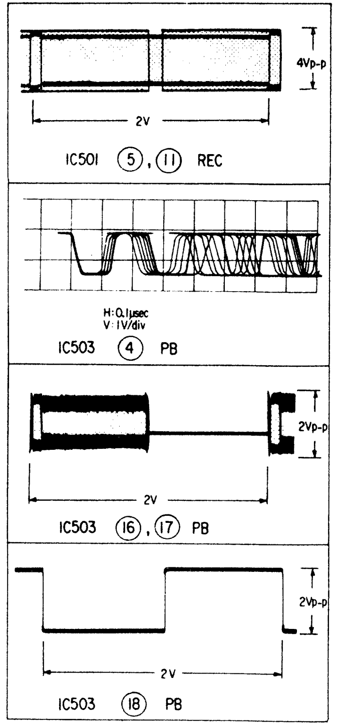
IC004 ⑧ PB 0.8Vp-p
IC006 ㊲ PB 0.24Vp-p

IC006 ① REC 0.68Vp-p
IC006 ⑤ REC 0.2Vp-p
IC006 ㉟ REC 0.6Vp-p

IC006 ① PB 0.8Vp-p
IC006 ⑦ PB 0.18Vp-p

IC006 ㊴ REC/PB

RP-20 BOARD



IC501 ⑤, ⑪ REC

IC503 ④ PB

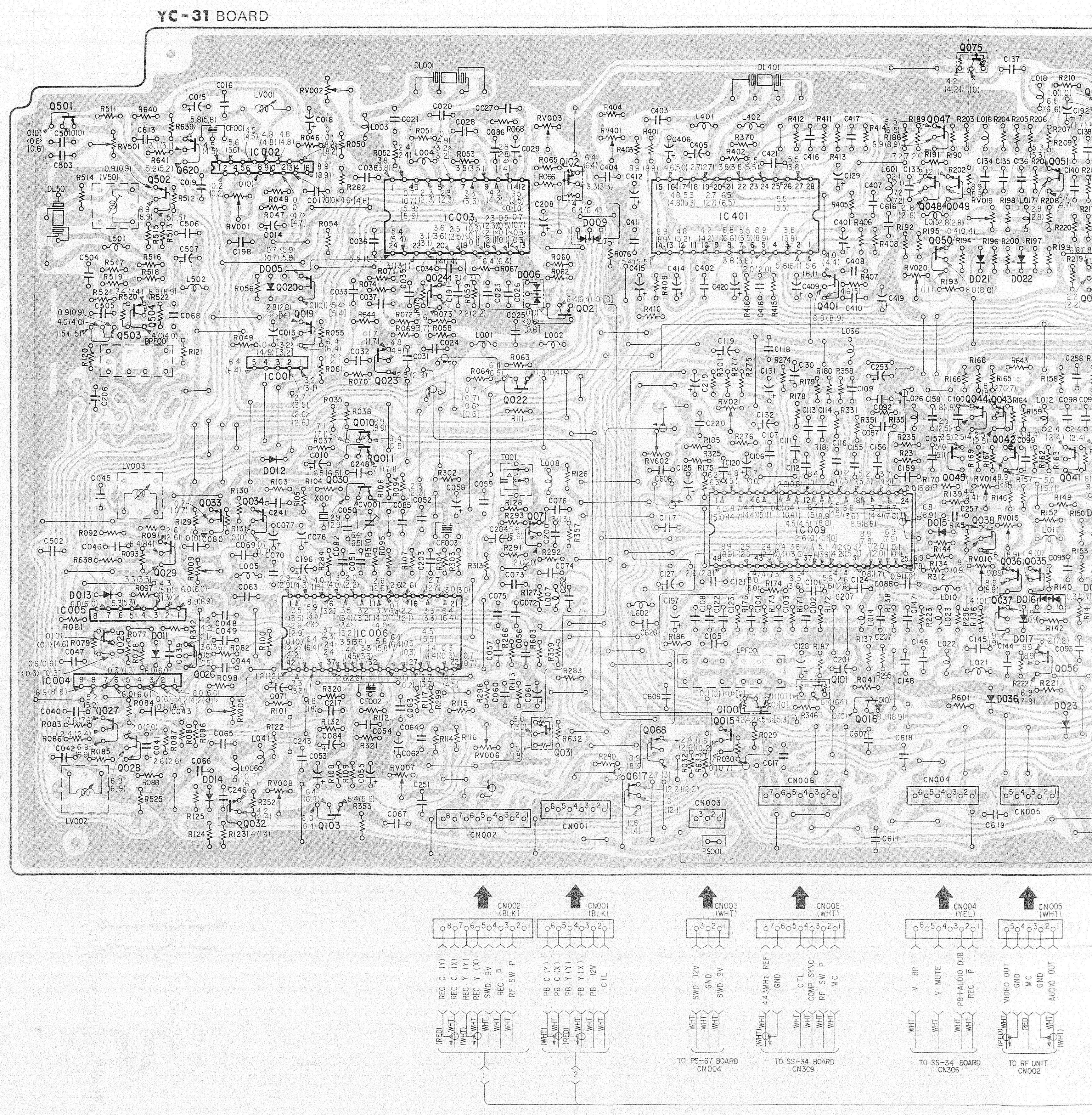
IC503 ⑯, ⑰ PB

IC503 ⑱ PB

4-2. YC-31 (Y, CHROMA SIGNAL PROCESS), RP-20 (VIDEO SIGNAL, REC/PB AMP) PRINTED WIRING BOARDS

– Ref. No. YC-31 BOARD : 1000 series, RP-20 BOARD : 2000 series –

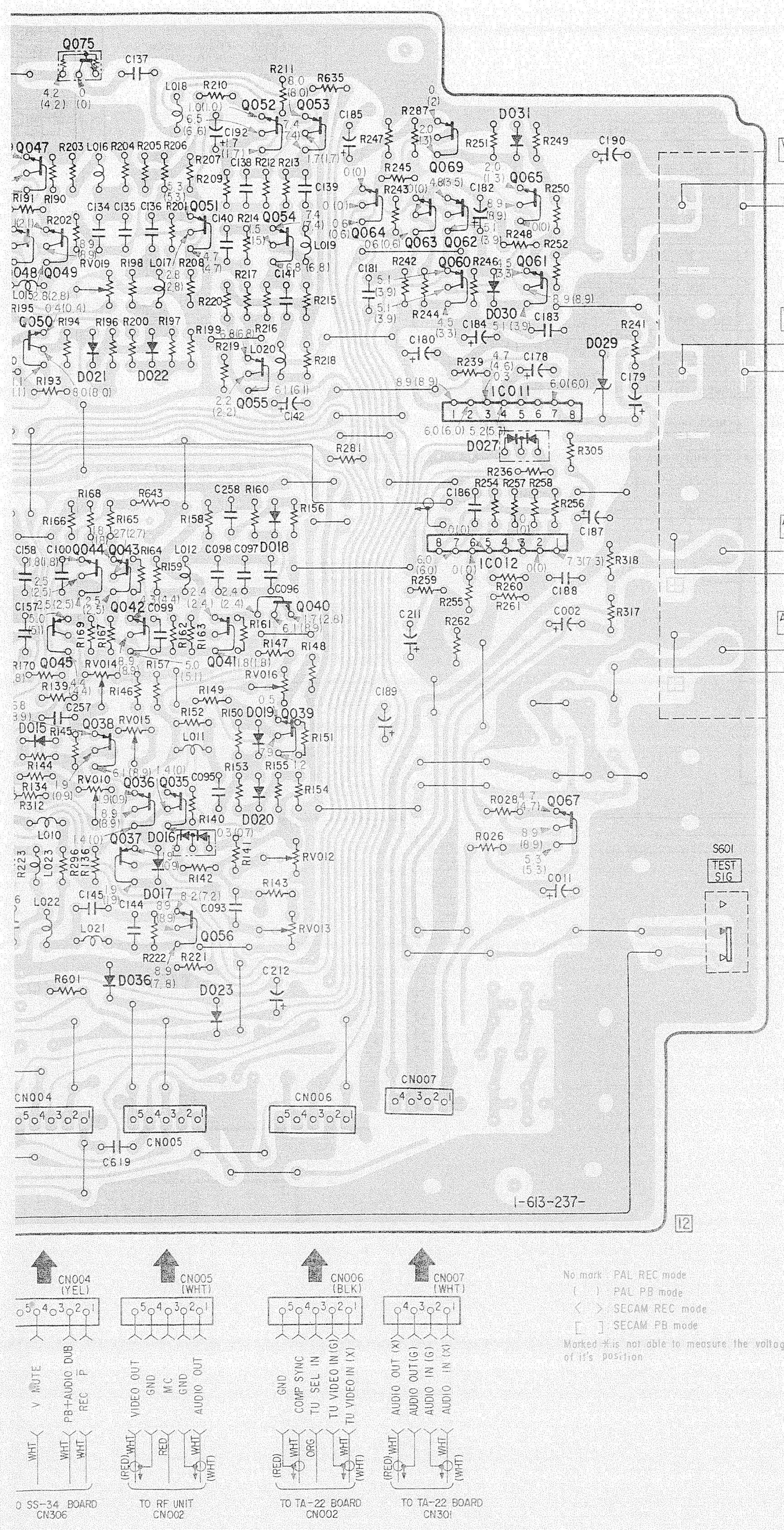
Q , IC	D	ADJ
075		
		RV002
052,053 069	031	LV001
501 047		RV003 RV401
620 064,065 063,062		RV501
IC002 051,054		
102,048,049		
502		RV001
IC003 060,061 IC401	030	LV501 RV019
	009	
050	021,022	
055		RV020
020, 401 024 IC011 021	005 006 029	
504		
503,019	027	
023 IC001		
	018	
022		
IC012		
		RV021
044,043		
010 045 040		
011 042,041		RV602
	012	
		RV014
030		LV003
		RV016
033,034		CV001
IC009 039	019	RV015
071,038,619	015	
029	020	RV009
035		RV010
036 067	013	
IC005 037	016	RV012
	017	
025	011	
026		RV013
IC004 056		
101	036	
100		
016	023	RV005
027 031 015		
028 068		RV006
		RV007
617		LV002
103	014	RV008
032		
Q , IC	D	ADJ


YC-31 BOARD
IC002
IC003
IC401
IC001
IC006
IC005
IC004
IC009
CN002
CN001
CN003
CN008
CN004
CN005
PS001
DL001
DL401
LPF001
CN002 (BLK)
8 7 6 5 4 3 2 1
REC C (Y)
REC C (X)
REC Y (Y)
REC Y (X)
SWD 9V
REC P̄
RF SW P
CN001 (BLK)
6 5 4 3 2 1
PB C (Y)
PB C (X)
PB Y (Y)
PB Y (X)
PB 12V
CTL
(RED)
(WHT)
WHT
1
2
CN003 (WHT)
3 2 1
SWD 12V
GND
SWD 9V
TO PS-67 BOARD CN004
CN008 (WHT)
7 6 5 4 3 2 1
4.43MHz REF
GND
CTL
COMP SYNC
RF SW P
MC
TO SS-34 BOARD CN309
CN004 (YEL)
6 5 4 3 2 1
V BP
V MUTE
PB+AUDIO DUB
REC P̄
TO SS-34 BOARD CN306
CN005 (WHT)
5 4 3 2 1
VIDEO OUT
GND
MC
GND
AUDIO OUT
RED
TO RF UNIT CN002

Note:

- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- ▨ : soldering side
- ▨ : B+ pattern

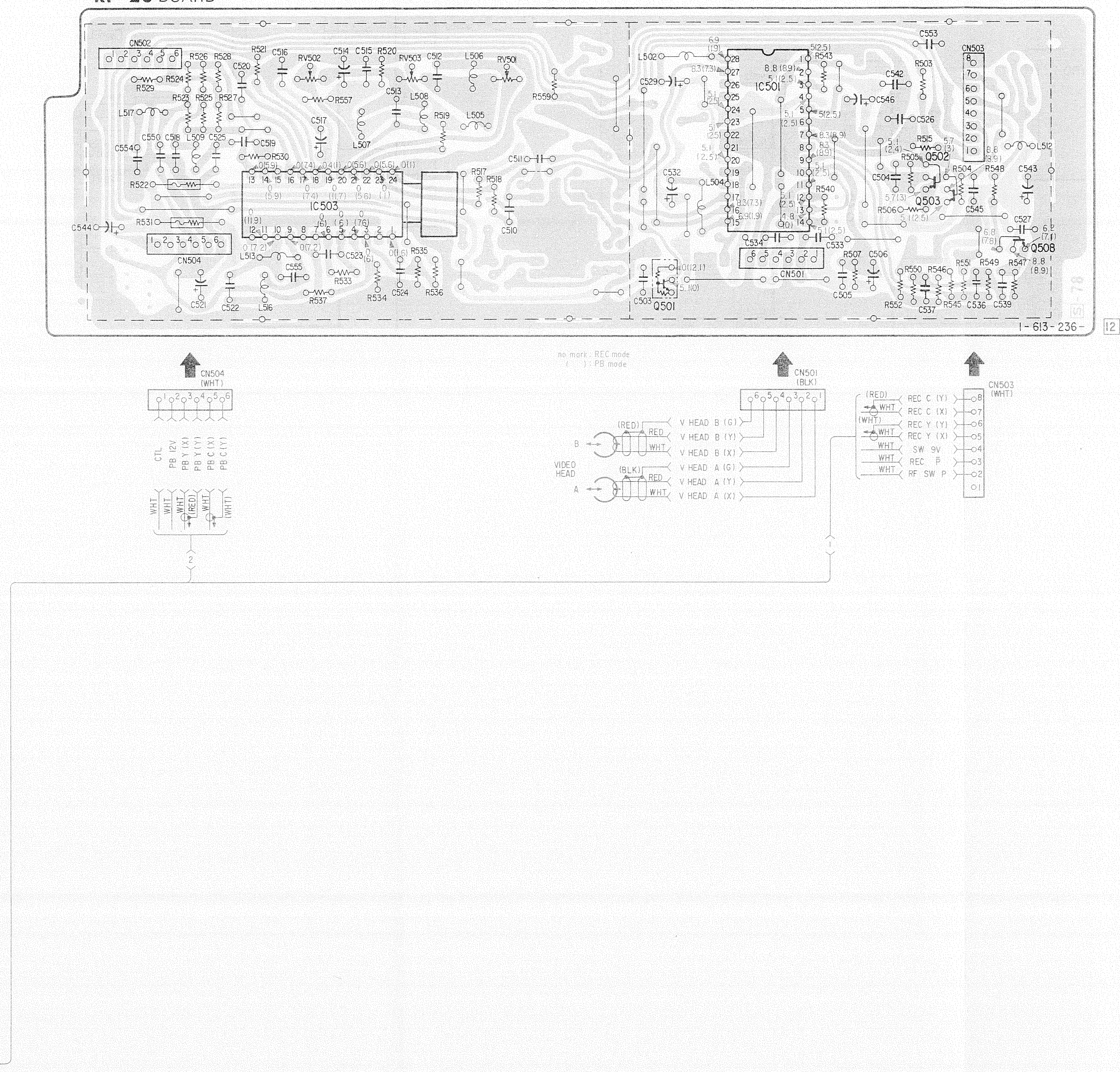
When indicating parts by reference number, please include the board name.


15
16
17
18
19
20
Q075
Q047
Q048
Q049
Q050
Q051
Q052
Q053
Q054
Q055
Q060
Q061
Q062
Q063
Q064
Q065
Q069
IC011
IC012
D027
D029
D030
D031
Q040
Q041
Q042
Q043
Q044
Q045
Q035
Q036
Q037
Q038
Q039
Q056
Q067
VIDEO OUT
VIDEO IN
AUDIO OUT
AUDIO IN
S601
TEST SIG
CN004
CN005
CN006
CN007
1-613-237-
12
CN004 (YEL)
V MUTE
PB+AUDIO DUB
REC P
CN005 (WHT)
VIDEO OUT
GND
MIC
GND
AUDIO OUT
CN006 (BLK)
GND
COMP SYNC
TU SEL IN
TU VIDEO IN (G)
TU VIDEO IN (X)
CN007 (WHT)
AUDIO OUT (X)
AUDIO OUT (G)
AUDIO IN (G)
AUDIO IN (X)
O SS-34 BOARD CN306
TO RF UNIT CN002
TO TA-22 BOARD CN002
TO TA-22 BOARD CN301

No mark : PAL REC mode
( ) : PAL PB mode
< > : SECAM REC mode
[ ] : SECAM PB mode
Marked ✳ is not able to measure the voltage of it's position

	21	22	23	24	25	26	27	28	
Q IC		IC503			501	IC501	502 503	508	Q IC
ADJ TP		RV502	RV503	RV501					ADJ TP

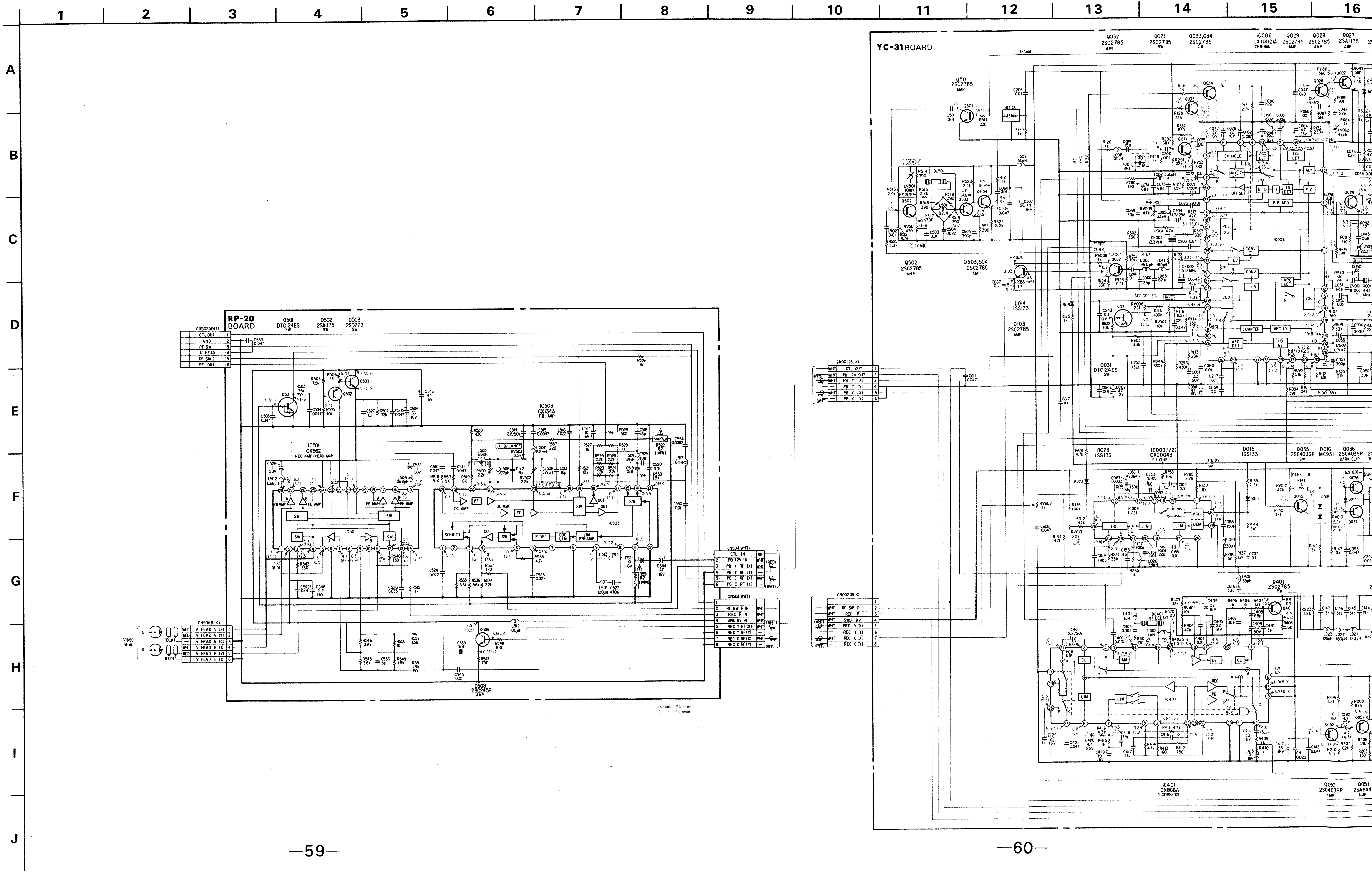
RP-20 BOARD

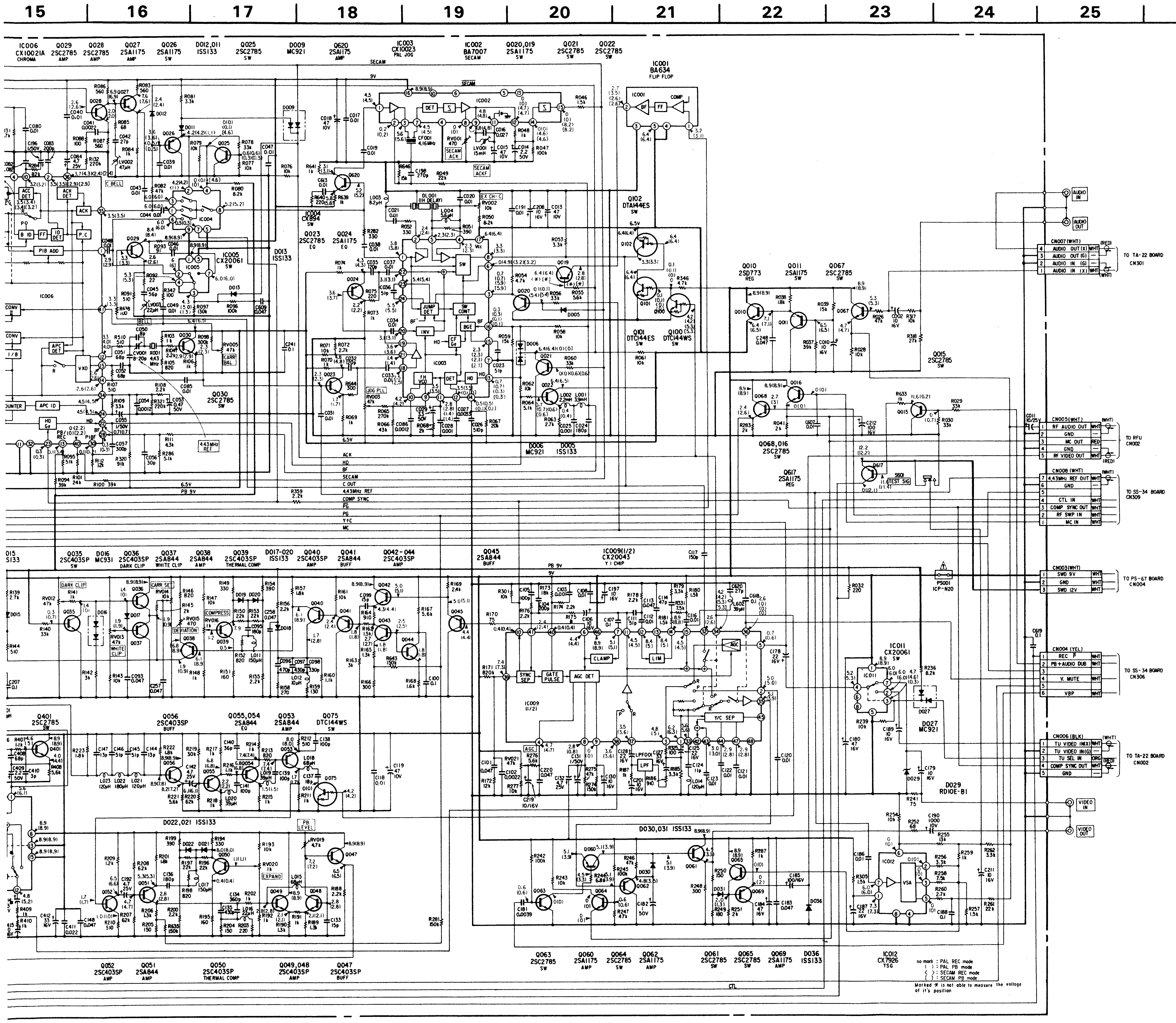

CN502
IC503
IC501
RV502
RV503
RV501
CN503
CN504
CN501
Q501
Q502
Q503
Q508
1-613-236-
12
CN504 (WHT)
CTL
PB 12V
PB Y (X)
PB Y (Y)
PB C (X)
PB C (Y)
CN501 (BLK)
V HEAD B (G)
V HEAD B (Y)
V HEAD B (X)
V HEAD A (G)
V HEAD A (Y)
V HEAD A (X)
VIDEO HEAD
A
B
CN503 (WHT)
REC C (Y)
REC C (X)
REC Y (Y)
REC Y (X)
SW 9V
REC P
RF SW P
29
30
A
B
C
D
E
F
G
H
I
J

no mark : REC mode
( ) : PB mode

YC-31 (Y, CHROMA SIGNAL PROCESS), RP-20 (VIDEO SIGNAL, REC/PB AMP) SCHEMATIC DIAGRAM

– Ref. No. YC-31 BOARD : 1000 series, RP-20 BOARD . 2000 series –


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
RP-20 BOARD
Q501 DTC124ES SW
Q502 2SA1175 SW
Q503 2SD773 SW
CN502(WHT)
CTL OUT
GND
RF SW 1
A' HEAD
RF SW 2
RF OUT
IC501 CX862 REC AMP/HEAD AMP
IC503 CX134A PB AMP
PB AMP
SW
DC AMP
FF
SCHMITT
P. DET
DOC LIM
LIM PREAMP
CH BALANCE
CN501(BLK)
V HEAD A (X)
V HEAD A (Y)
V HEAD A (G)
V HEAD B (X)
V HEAD B (Y)
V HEAD B (G)
VIDEO HEAD
CN504(WHT)
CTL IN
PB 12V IN
PB Y RF (X)
PB Y RF (Y)
PB C RF (X)
PB C RF (Y)
CN503(WHT)
RF SW P IN
REC P IN
SWD 9V IN
REC Y RF(X)
REC Y RF(Y)
REC C RF(X)
REC C RF(Y)
Q508 2SC2458 AMP
YC-31 BOARD
CN001(BLK)
CTL OUT
PB 12V OUT
PB Y (X)
PB Y (Y)
PB C (X)
PB C (Y)
CN002(BLK)
RF SW P
REC P
SWD 9V
REC Y (X)
REC Y (Y)
REC C (X)
REC C (Y)
Q501 2SC2785 AMP
Q502 2SC2785 AMP
Q503,504 2SC2785 AMP
Q032 2SC2785 AMP
Q071 2SC2785 SW
Q033,034 2SC2785 SW
IC006 CX10021A CHROMA
Q029 2SC2785 AMP
Q028 2SC2785 AMP
Q027 2SA1175 AMP
D014 1SS133
Q103 2SC2785 AMP
Q031 DTC124ES SW
D023 1SS133
IC009(1/2) CX20043 Y C CHIP
D015 1SS133
Q035 2SC403SP SW
D016 MC931
Q036 2SC403SP DARK CLIP
Q401 2SC2785 SW
IC401 CX866A Y COMB/DOC
Q052 2SC403SP AMP
Q051 2SA844 AMP
CH HOLD
ACC DET
ACK
PLL X3
CONV
INV
VCO
VXO
COUNTER
APC ID
APC DET
AFC DET
F/B
DOC
LIM
MOD
DEM
CL
AM
DET
SECAM


15
16
17
18
19
20
21
22
23
24
IC006 CX10021A CHROMA
Q029 2SC2785 AMP
Q028 2SC2785 AMP
Q027 2SA1175 AMP
Q026 2SA1175 SW
D012,011 1SS133
Q025 2SC2785 SW
D009 MC921
Q620 2SA1175 AMP
IC003 CX10023 PAL JOG
IC002 BA7007 SECAM
Q020,019 2SA1175 SW
Q021 2SC2785 SW
Q022 2SC2785 SW
IC001 BA634 FLIP FLOP
IC004 CX894 SW
Q023 2SC2785 EQ
Q024 2SA1175 EQ
IC005 CX20061 SW
D013 1SS133
Q030 2SC2785 SW
D006 MC921
D005 1SS133
Q102 DTA144ES SW
Q101 DTC144ES SW
Q100 DTC144WS SW
Q010 2SD773 REG
Q011 2SA1175 SW
Q067 2SC2785 SW
Q015 2SC2785 SW
Q068,016 2SC2785 SW
Q617 2SA1175 REG
S601 TEST SIG
SECAM
9V
6.5V
PB 9V
ACK
HD
BF
SECAM
C OUT
4.43MHz REF
COMP SYNC
PG
PG
Y+C
MC
CTL
AUDIO IN
AUDIO OUT
CN007 (WHT)
4 AUDIO OUT (X) WHT
3 AUDIO OUT (G)
2 AUDIO IN (G)
1 AUDIO IN (X) WHT
TO TA-22 BOARD CN301
CN005 (WHT)
1 RF AUDIO OUT WHT
2 GND
3 MC OUT RED
4 GND
5 RF VIDEO OUT WHT
TO RFU CN002
CN008 (WHT)
7 4.43MHz REF OUT WHT
6 GND
5
4 CTL IN WHT
3 COMP SYNC OUT WHT
2 RF SWP IN WHT
1 MC IN WHT
TO SS-34 BOARD CN309
CN003 (WHT)
1 SWD 9V WHT
2 GND WHT
3 SWD 12V WHT
TO PS-67 BOARD CN004
PS001 ICP-N20
CN004 (YEL)
1 REC P WHT
2 PB+AUDIO DUB WHT
3
4 V. MUTE WHT
5
6 VBP WHT
TO SS-34 BOARD CN306
CN006 (BLK)
1 TU VIDEO IN (X) WHT
2 TU VIDEO IN (G)
3 TU SEL IN ORG
4 COMP SYNC OUT WHT
5 GND
TO TA-22 BOARD CN002
VIDEO IN
VIDEO OUT
D015 1SS133
Q035 2SC403SP SW
D016 MC931
Q036 2SC403SP DARK CLIP
Q037 2SA844 WHITE CLIP
Q038 2SA844 AMP
Q039 2SC403SP THERMAL COMP
D017-020 1SS133
Q040 2SC403SP AMP
Q041 2SA844 BUFF
Q042-044 2SC403SP AMP
Q045 2SA844 BUFF
IC009(1/2) CX20043 Y I CHIP
DARK CLIP
CARR SET
COMPRESS
DEVIATION
WHITE CLIP
SYNC SEP
GATE PULSE
AGC DET
CLAMP
LIM
AGC
Y/C SEP
IC009 (1/2)
IC011 CX20061 SW
D027 MC921
D029 RD10E-B1
Q401 2SC2785 SW
Q056 2SC403SP BUFF
Q055,054 2SA844 EQ
Q053 2SA844 AMP
Q075 DTC144WS SW
D022,021 1SS133
PB LEVEL
EXPAND
D030,031 1SS133
IC012 VSA
Q052 2SC403SP AMP
Q051 2SA844 AMP
Q050 2SC403SP THERMAL COMP
Q049,048 2SC403SP AMP
Q047 2SC403SP BUFF
Q063 2SC2785 SW
Q060 2SA1175 AMP
Q064 2SC2785 SW
Q062 2SA1175 AMP
Q061 2SC2785 SW
Q065 2SC2785 SW
Q069 2SA1175 AMP
D036 1SS133
IC012 CX7926 TSG
no mark : PAL REC mode
( ) : PAL PB mode
< > : SECAM REC mode
[ ] : SECAM PB mode
Marked * is not able to measure the voltage of it's position
25
26
27
28
29
30
A
B
C
D
E
F
G
H
I
J

Note:

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : Nonflammable resistor
- ▭ : Fusible resistor
- The voltage value is reference value between the grounding when the color bar signal is received from a color bar generator.
- The voltage value is measured using a digital tester (10MΩ).

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

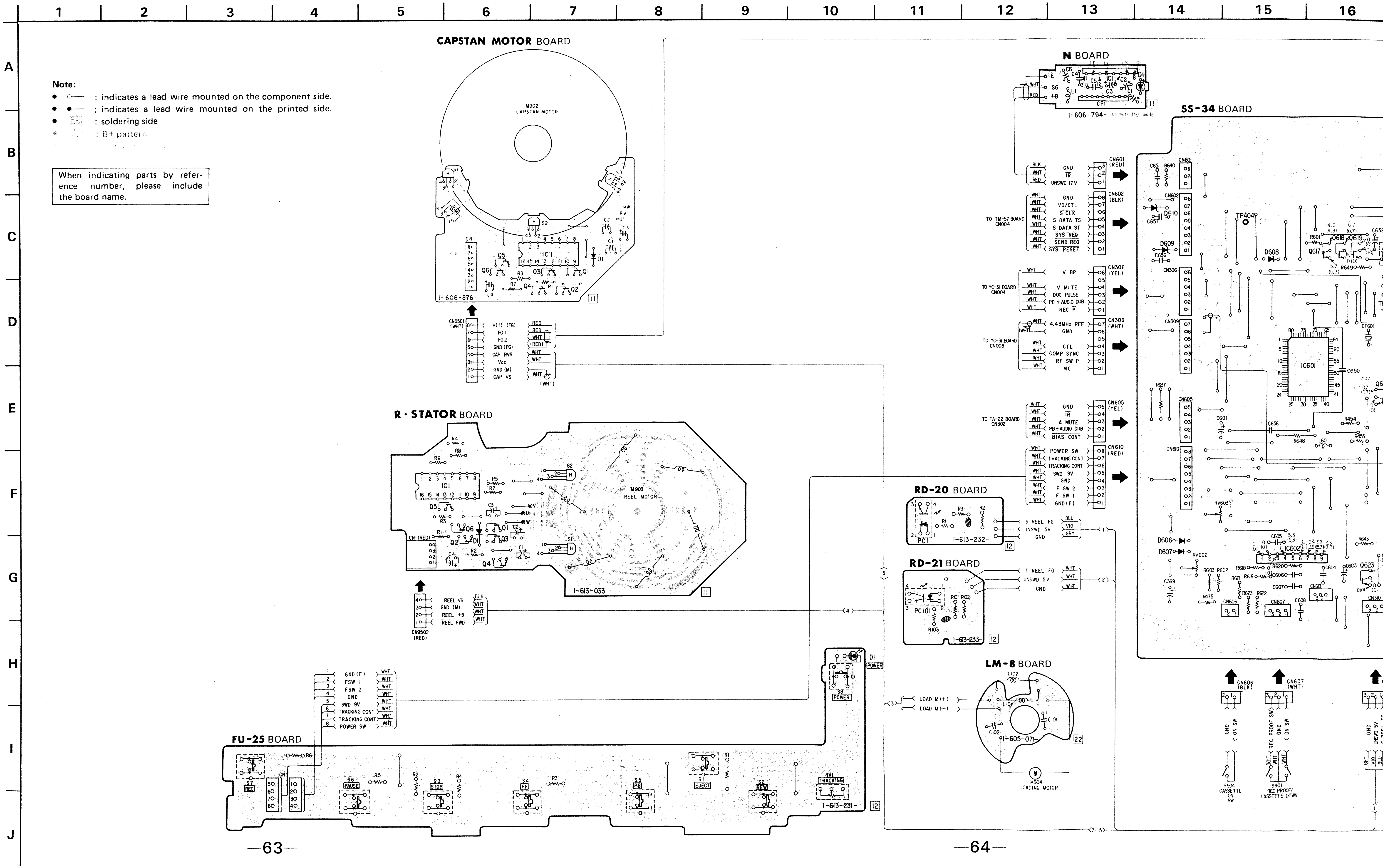
When indicating parts by reference number, please include the board name.

4-3. SS-34 (SYSTEM CONTROL, SERVO), RD-20 (ROTATION DETECTOR), RD-21 (ROTATION DETECTOR), LM-8 (LOADING MOTOR), FU-25 (FUNCTION, TRACKING CONTROL), N (INFRARED AMP), CAPSTAN MOTOR (CAPSTAN MOTOR), R. S

– Ref. No. SS-34, RD-20, RD-21 BOARD : 4000 series, LM-8 BOARD : 9000 series, FU-25 BOARD : 8000 series, N BOARD : 8300 series, CAPSTAN MOTOR BOARD : 8200 series, R. STATOR BOARD : 8100 series –

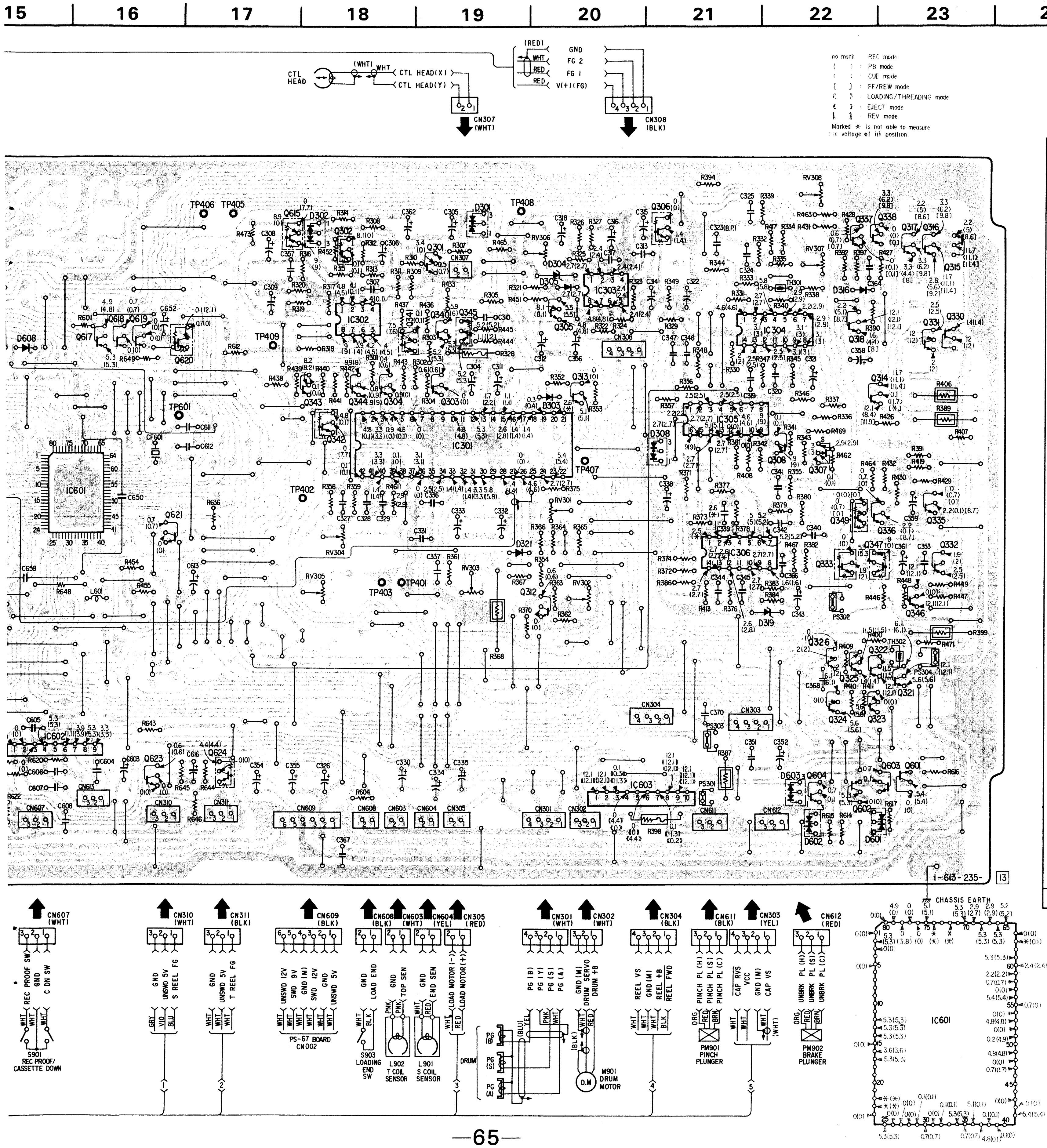
Note:
- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- ▨ : soldering side
- ▨ : B+ pattern

When indicating parts by reference number, please include the board name.


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
CAPSTAN MOTOR BOARD
M902 CAPSTAN MOTOR
1-608-876
CN9501 (WHT)
V(+) (FG)
FG 1
FG 2
GND (FG)
CAP RVS
Vcc
GND (M)
CAP VS
R · STATOR BOARD
M903 REEL MOTOR
1-613-033
CN9502 (RED)
REEL VS
GND (M)
REEL +B
REEL FWD
FU-25 BOARD
GND (F)
FSW 1
FSW 2
GND
SWD 9V
TRACKING CONT
TRACKING CONT
POWER SW
S7 REC
S6 PAUSE
S3 STOP
S4 FF
S5 PB
S1 EJECT
S2 REW
RV1 TRACKING
S8 POWER
D1 POWER
1-613-231
N BOARD
1-606-794-
SS-34 BOARD
CN601 (RED)
GND
IR
UNSWD 12V
CN602 (BLK)
TO TM-57 BOARD CN004
VD/CTL
S CLK
S DATA TS
S DATA ST
SYS REQ
SEND REQ
SYS RESET
CN306 (YEL)
TO YC-31 BOARD CN004
V BP
V MUTE
DOC PULSE
PB + AUDIO DUB
REC P
CN309 (WHT)
TO YC-31 BOARD CN008
4.43MHz REF
CTL
COMP SYNC
RF SW P
MC
CN605 (YEL)
TO TA-22 BOARD CN302
A MUTE
PB+AUDIO DUB
BIAS CONT
CN610 (RED)
POWER SW
TRACKING CONT
SWD 9V
F SW 2
F SW 1
GND (F)
IC601
IC602
TP404
RD-20 BOARD
S REEL FG
UNSWD 5V
PC1
1-613-232-
RD-21 BOARD
T REEL FG
PC101
1-613-233-
LM-8 BOARD
LOAD M (+)
LOAD M (−)
1-605-071-
M904 LOADING MOTOR
CN606 (BLK)
CN607 (WHT)
C ON SW
REC PROOF SW
S904 CASSETTE ON SW
S901 REC PROOF/ CASSETTE DOWN
UNSWD 5V

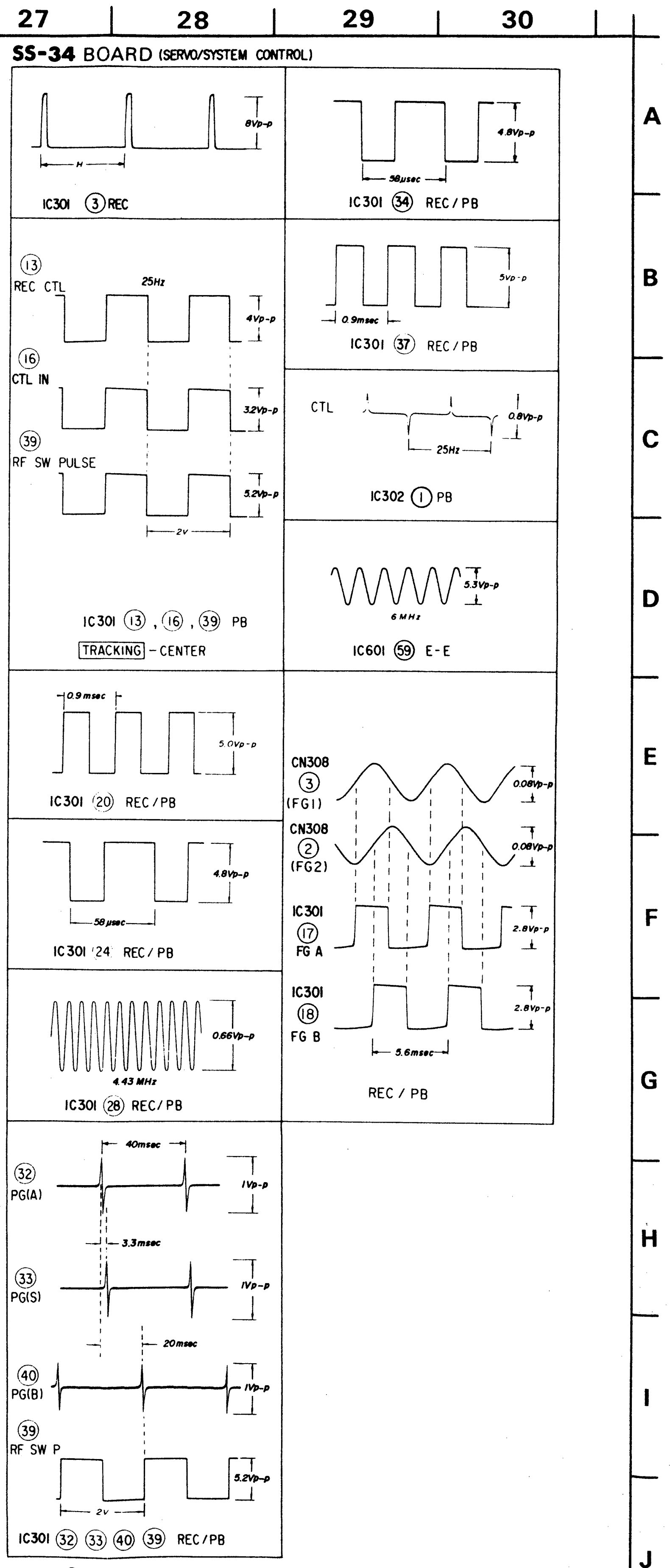
APSTAN MOTOR), R. STATOR (REEL MOTOR) PRINTED WIRING BOARDS

no mark REC mode
( ) : PB mode
⟨ ⟩ : CUE mode
[ ] : FF/REW mode
⟪ ⟫ : LOADING/THREADING mode
{ } : EJECT mode
⟦ ⟧ : REV mode
Marked * is not able to measure the voltage of its position.


15
16
17
18
19
20
21
22
23
24
25
26
CTL HEAD
(WHT)
WHT
CTL HEAD(X)
CTL HEAD(Y)
CN307 (WHT)
(RED)
WHT
RED
RED
GND
FG 2
FG 1
V(+)(FG)
CN308 (BLK)
IC601
IC602
IC603
IC301
IC302
IC303
IC304
IC305
IC306
TP401
TP402
TP403
TP404
TP405
TP406
TP407
TP408
TP409
TP601
RV301
RV302
RV303
RV304
RV305
RV306
RV307
RV308
PS301
PS302
PS303
PS304
TH302
CN301
CN302
CN303
CN304
CN305
CN306
CN307
CN308
CN309
CN310
CN311
CN603
CN604
CN607
CN608
CN609
CN611
CN612
1-613-235-
13
CN607 (WHT)
REC PROOF SW
GND
C DN SW
WHT
WHT
WHT
S901 REC PROOF/ CASSETTE DOWN
CN310 (WHT)
GND
UNSWD 5V
S REEL FG
GRY
VIO
BLU
1
CN311 (BLK)
GND
UNSWD 5V
T REEL FG
WHT
WHT
WHT
2
CN609 (BLK)
UNSWD 12V
SWD 9V
GND (M)
SWD 12V
GND
UNSWD 5V
PS-67 BOARD CN002
CN608 (BLK)
GND
LOAD END
WHT
BLK
S903 LOADING END SW
CN603 (WHT)
GND
TOP SEN
PNK
PNK
L902 T COIL SENSOR
CN604 (YEL)
GND
END SEN
WHT
RED
L901 S COIL SENSOR
CN305 (RED)
LOAD MOTOR(−)
LOAD MOTOR(+)
WHT
RED
3
DRUM
PG (B)
PG (S)
PG (A)
(BLU)
YEL
CN301 (WHT)
PG (B)
PG (Y)
PG (S)
PG (A)
PNK
WHT
CN302 (WHT)
GND (M)
DRUM SERVO
DRUM +B
(BLK)
WHT
RED
M901 DRUM MOTOR
D.M
CN304 (BLK)
REEL VS
GND (M)
REEL +B
REEL FWD
WHT
WHT
WHT
BLK
4
CN611 (BLK)
PINCH PL (H)
PINCH PL (S)
PINCH PL (C)
ORG
RED
BRN
PM901 PINCH PLUNGER
CN303 (YEL)
CAP RVS
VCC
GND (M)
CAP VS
WHT
WHT
WHT
(WHT)
5
CN612 (RED)
UNBRK PL (H)
UNBRK PL (S)
UNBRK PL (C)
ORG
RED
BRN
PM902 BRAKE PLUNGER
CHASSIS EARTH
IC601

Q , IC	D	ADJ,TP
		RV308 TP408 TP406,TP405
306 615 337,338 317,316 302,301 315	301 302	RV306 RV307
IC303	610 304 316 305	TP404
305 IC302 340, 345 619,620 IC304 617,618,318,330 341,331	609	TP409
313 304,303 343,344 314 342 IC305	608 303	TP601
308,307 IC301	308	TP407
IC601 335 349,336		TP402 RV301
621		RV304
IC306 333,332 347	321	TP401 TP403 RV303 RV305 RV302
346 312	319	
326,322 325 321 323 324	606 607	
IC602 623,624 603,601 604,602 IC603	603 601 602	
Q , IC	D	ADJ,TP

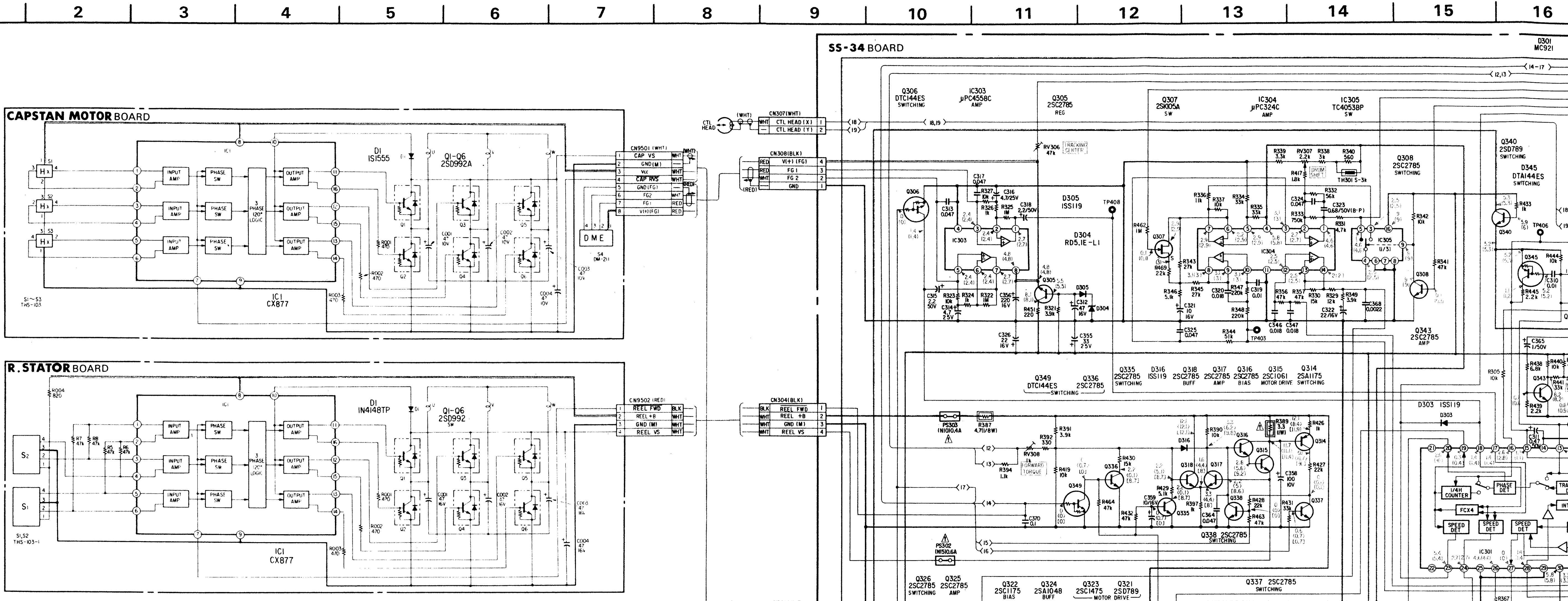
SS-34 BOARD (SERVO/SYSTEM CONTROL)

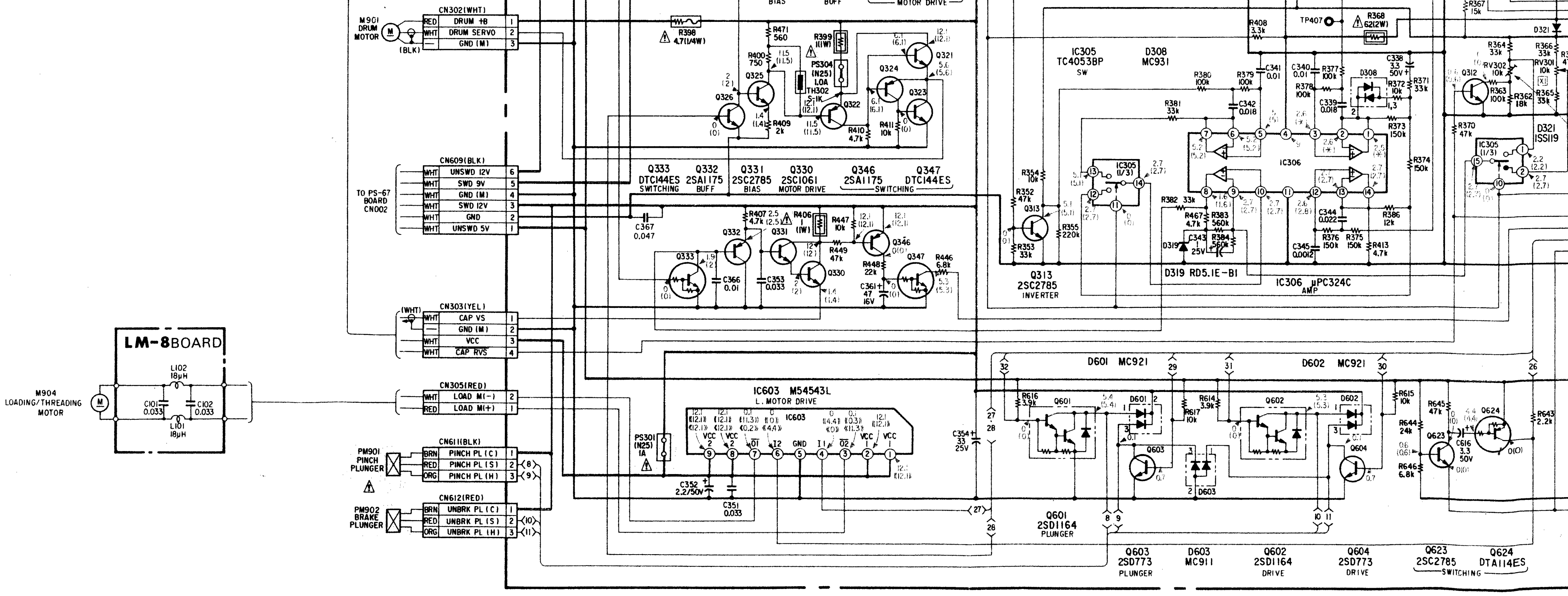


SERVO/SYSTEM CONTROL SERVO/SYSTEM CONTROL

SS-34 (SYSTEM CONTROL, SERVO), RD-20 (ROTATION DETECTOR), RD-21 (ROTATION DETECTOR), LM-8 (LOADING MOTOR), FU-25 (FUNCTION, TRACKING CONTROL), N (INFRARED AMP), CAPSTAN MOTOR (CAPSTAN MOTOR), R. STA

– Ref. No. SS-34, RD-20, RD-21 BOARD : 4000 series, LM-8 BOARD : 9000 series, FU-25 BOARD : 8000 series, N BOARD : 8300 series, CAPSTAN MOTOR BOARD : 8200 series, R. STATOR BOARD : 8100 series –


CAPSTAN MOTOR BOARD
IC1 CX877
D1 1S1555
Q1-Q6 2SD992A
INPUT AMP
PHASE SW
3 PHASE 120° LOGIC
OUTPUT AMP
DME
CN9501 (WHT)
R.STATOR BOARD
D1 1N4148TP
Q1-Q6 2SD992
CN9502 (RED)
CTL HEAD
CN307 (WHT)
CN308 (BLK)
CN304 (BLK)
SS-34 BOARD
Q306 DTC144ES SWITCHING
IC303 μPC4558C AMP
Q305 2SC2785 REG
Q307 2SK105A SW
IC304 μPC324C AMP
IC305 TC4053BP SW
Q340 2SD789 SWITCHING
Q345 DTA144ES SWITCHING
Q308 2SC2785 SWITCHING
Q343 2SC2785 AMP
Q349 DTC144ES SWITCHING
Q336 2SC2785 SWITCHING
Q335 2SC2785 SWITCHING
D316 1SS119
Q318 2SC2785 BUFF
Q317 2SC2785 AMP
Q316 2SC2785 BIAS
Q315 2SC1061 MOTOR DRIVE
Q314 2SA1175 SWITCHING
Q338 2SC2785 SWITCHING
D303 1SS119
IC301


M901 DRUM MOTOR
CN302 (WHT)
Q326 2SC2785 SWITCHING
Q325 2SC2785 AMP
Q322 2SC1175 BIAS
Q324 2SA1048 BUFF
Q323 2SC1475 MOTOR DRIVE
Q321 2SD789
Q337 2SC2785 SWITCHING
IC305 TC4053BP SW
D308 MC931
IC306 μPC324C AMP
Q313 2SC2785 INVERTER
D319 RD5.1E-B1
D321 1SS119
TO PS-67 BOARD CN002
CN609 (BLK)
Q333 DTC144ES SWITCHING
Q332 2SA1175 BUFF
Q331 2SC2785 BIAS
Q330 2SC1061 MOTOR DRIVE
Q346 2SA1175
Q347 DTC144ES SWITCHING
CN303 (YEL)
LM-8 BOARD
M904 LOADING/THREADING MOTOR
CN305 (RED)
IC603 M54543L L. MOTOR DRIVE
PM901 PINCH PLUNGER
CN611 (BLK)
PM902 BRAKE PLUNGER
CN612 (RED)
D601 MC921
D602 MC921
Q601 2SD1164 PLUNGER
Q603 2SD773 PLUNGER
D603 MC911
Q602 2SD1164 DRIVE
Q604 2SD773 DRIVE
Q623 2SC2785
Q624 DTA114ES SWITCHING

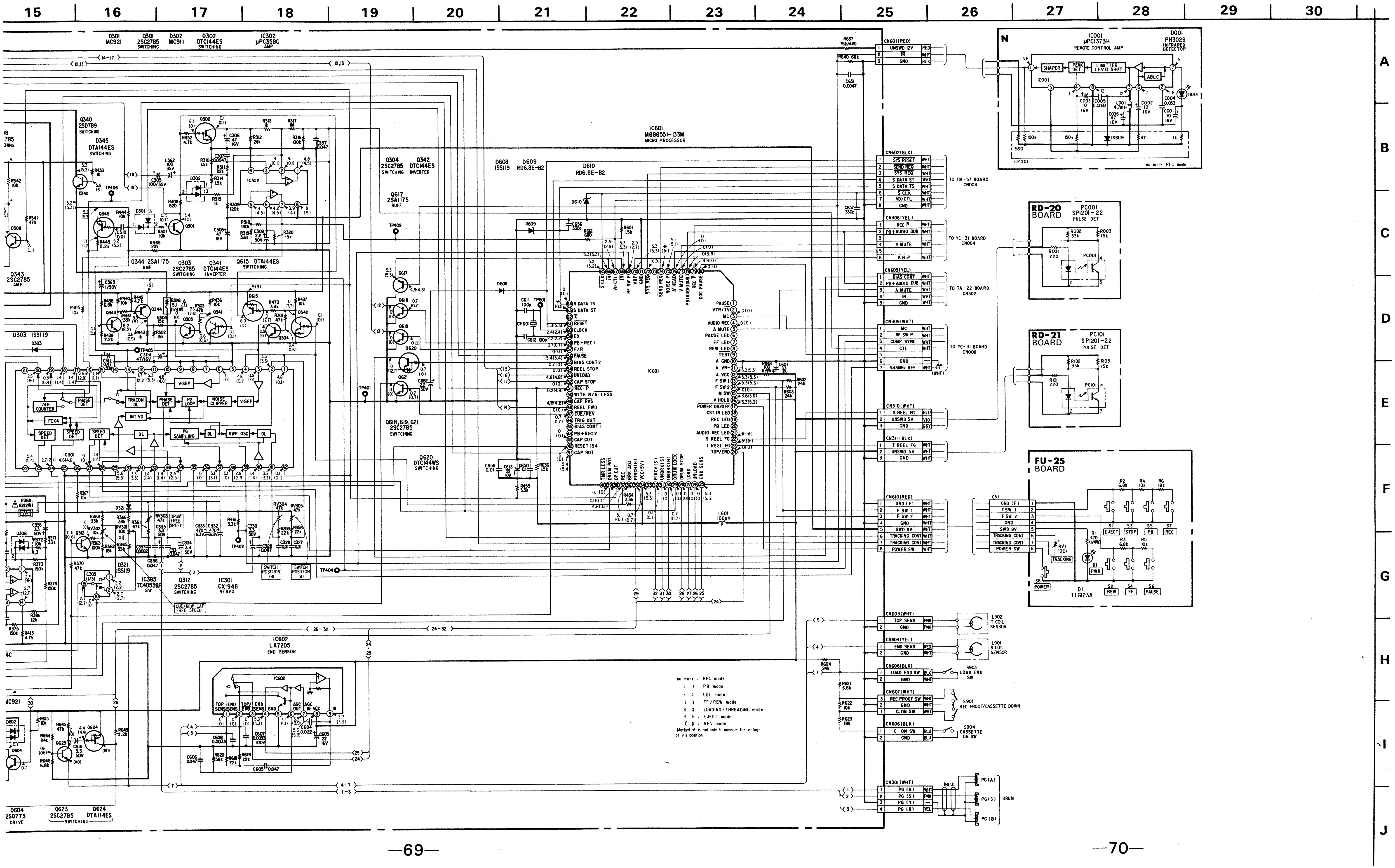
Note:

- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : Nonflammable resistor
- ▭ : Fusible resistor
- ―― : B+ bus.
- The voltage value is reference value between the grounding when the color bar signal is received from a color bar generator.
- The voltage value is measured using a digital tester (10MΩ).

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

STAN MOTOR), R. STATOR (REEL MOTOR) SCHEMATIC DIAGRAM


15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
A
B
C
D
E
F
G
H
I
J
D301 MC921
Q301 2SC2785 SWITCHING
D302 MC911
Q302 DTC144ES SWITCHING
IC302 μPC358C AMP
Q340 2SD789 SWITCHING
D345 DTA144ES SWITCHING
Q343 2SC2785 AMP
Q344 2SA1175 AMP
Q303 2SC2785 SWITCHING
Q341 DTC144ES INVERTER
Q615 DTA144ES SWITCHING
Q304 2SC2785 SWITCHING
Q342 DTC144ES INVERTER
Q617 2SA1175 BUFF
Q618,619,621 2SC2785 SWITCHING
Q620 DTC144WS SWITCHING
D303 1SS119
IC301 CX194B SERVO
IC305 TC4053BP SW
Q312 2SC2785 SWITCHING
D321 1SS119
CUE/REW CAP FREE SPEED
DRUM FREE SPEED
SWITCH POSITION (B)
SWITCH POSITION (A)
TP401
TP402
TP404
TP405
TP406
TP409
TP601
1/4H COUNTER
PHASE DET
TRACON DL
PHASE DET
P2 LOOP
NOISE CLIPPER
V-SEP
V-SEP
INT VD
FCX4
SPEED DET
SPEED DET
SPEED DET
PG SAMPLING
DL
SWP OSC
DL
DL
IC601 MB88551-133M MICRO PROCESSOR
D608 1SS119
D609 RD6.8E-B2
D610 RD6.8E-B2
S DATA TS
S DATA ST
RESET
CLOCK
EX
PB+REC1
F/R
PAUSE
BIAS CONT2
REEL STOP
UNLOAD
CAP STOP
REC-P
WITH N/N-LESS
CAP RVS
REEL FWD
CUE/REV
TRIG OUT
BIAS CONT1
PB+REC2
CAP CUT
RESET 194
CAP ROT
PAUSE
VTR/TV
MC
AUDIO REC
A MUTE
PAUSE LED
FF LED
REW LED
TEST
A GND
A VR-
A VCC
F SW1
F SW2
M SW
V HOLD
POWER ON/OFF
CST IN LED
REC LED
PB LED
AUDIO REC LED
S REEL FG
T REEL FG
TOP/END
S CLK
VD CTL
IR
RF SW P
VBP
GND
SYS REQ
SEND REQ
NOISE P
V MUTE
PB(AUDIO DUB)
REC P
DOC PAUSE
TMR LESS
DRUM ROT
OP CUT
REC
BRK ADJ
PINCH(H)
VCC(5V)
PINCH(S)
UNBRK(S)
UNBRK(H)
DRUM LOCK
DRUM STOP
LOAD
UNLOAD
END SENS
L601 100μH
IC602 LA7205 END SENSOR
TOP SENS
END SENS
TOP/END
END SENS
GND
AGC OUT
AGC IN
VCC
IN
no mark : REC mode
( ) : PB mode
< > : CUE mode
{ } : FF/REW mode
〔 〕 : LOADING/THREADING mode
〈 〉 : EJECT mode
【 】 : REV mode
Marked ✻ is not able to measure the voltage of its position.
CN601(RED)
UNSWD 12V
IR
GND
CN602(BLK)
SYS RESET
SEND REQ
SYS REQ
S DATA ST
S DATA TS
S CLK
VD/CTL
GND
TO TM-57 BOARD CN004
CN306(YEL)
REC P
PB+AUDIO DUB
V MUTE
V.B.P
TO YC-31 BOARD CN004
CN605(YEL)
BIAS CONT
PB+AUDIO DUB
A MUTE
IR
GND
TO TA-22 BOARD CN302
CN309(WHT)
MC
RF SW P
COMP SYNC
CTL
GND
4.43MHz REF
TO YC-31 BOARD CN008
CN310(WHT)
UNSWD 5V
GND
CN311(BLK)
T REEL FG
UNSWD 5V
GND
CN610(RED)
GND (F)
F SW 1
F SW 2
GND
SWD 9V
TRACKING CONT
TRACKING CONT
POWER SW
CN603(WHT)
TOP SENS
GND
L902 T COIL SENSOR
CN604(YEL)
END SENS
GND
L901 S COIL SENSOR
CN608(BLK)
LOAD END SW
GND
S903 LOAD END SW
CN607(WHT)
REC PROOF SW
GND
C. DN SW
S901 REC PROOF/CASSETTE DOWN
CN606(BLK)
C ON SW
GND
S904 CASSETTE ON SW
CN301(WHT)
PG (A)
PG (S)
PG (Y)
PG (B)
PG(A)
PG(S)
PG(B)
DRUM
N
IC001 μPC1373H REMOTE CONTROL AMP
D001 PH302B INFRARED DETECTOR
SHAPER
PEAK DET
LIMITTER LEVEL SHIFT
ABLC
L001 4.7mH
CP001
no mark : REC mode
RD-20 BOARD
PC001 SP1201-22 PULSE DET
RD-21 BOARD
PC101 SP1201-22 PULSE DET
FU-25 BOARD
CN1
GND (F)
F SW 1
F SW 2
GND
SWD 9V
TRACKING CONT
TRACKING CONT
POWER SW
RV1 100k
TRACKING
S1 EJECT
S3 STOP
S5 PB
S7 REC
S2 REW
S4 FF
S6 PAUSE
S8 POWER
D1 PWR
D1 TLG123A
Q604 2SD773 DRIVE
Q623 2SC2785
Q624 DTA114ES
SWITCHING
MC921
D602
Q604
Q623
Q624

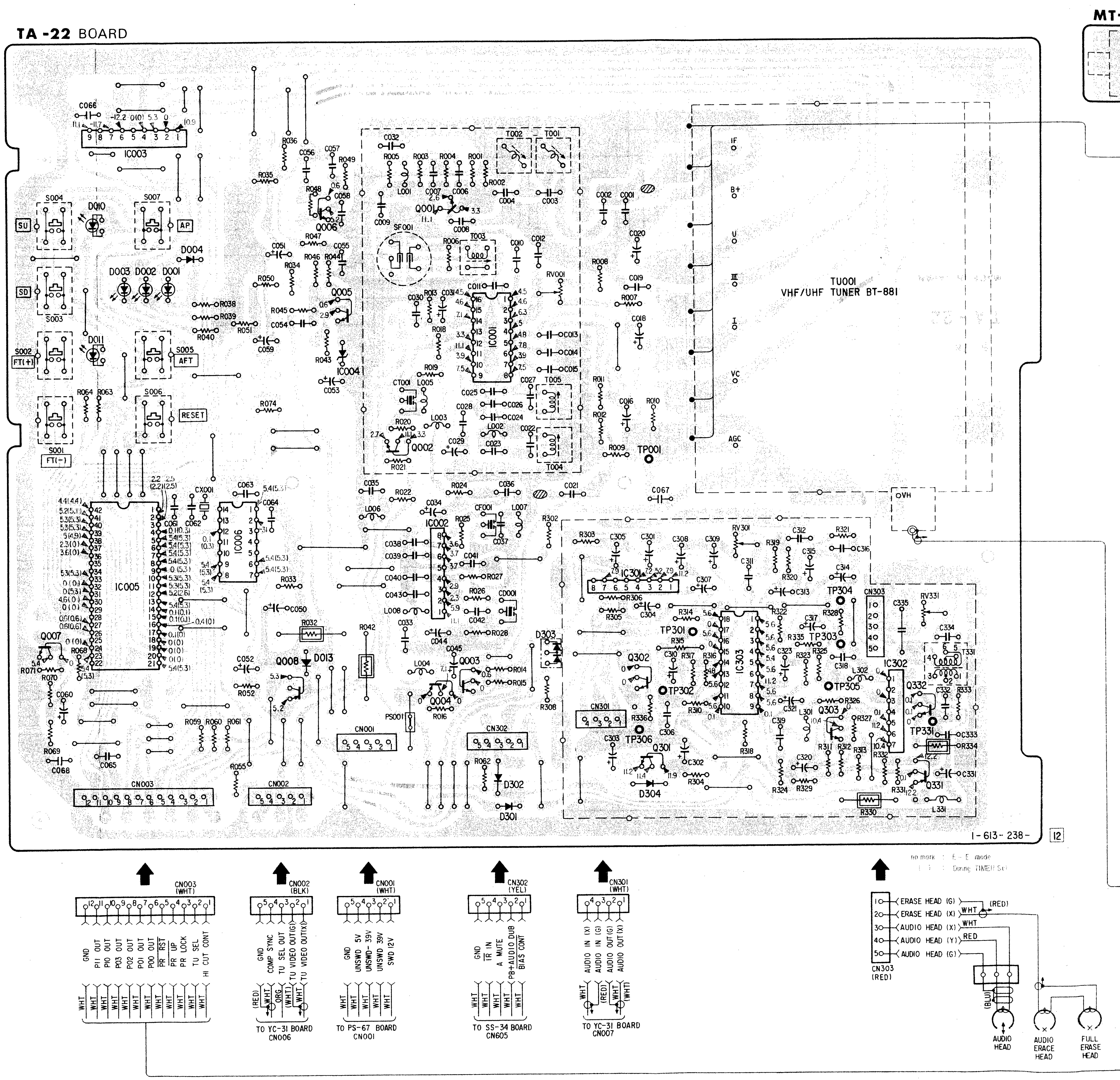
4-4. TA-22 (VIF, AFT, SIF, AUTO PROGRAM AUDIO), MT-10 (TUNER), TM-57 (TIMER INDICATOR), TM-58 (SWITCH) PRINTED WIRING BOARDS

– Ref. No. TA-22, MT-10 BOARD : 5000 series, TM-57, TM-58 BOARD : 6000 series –

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

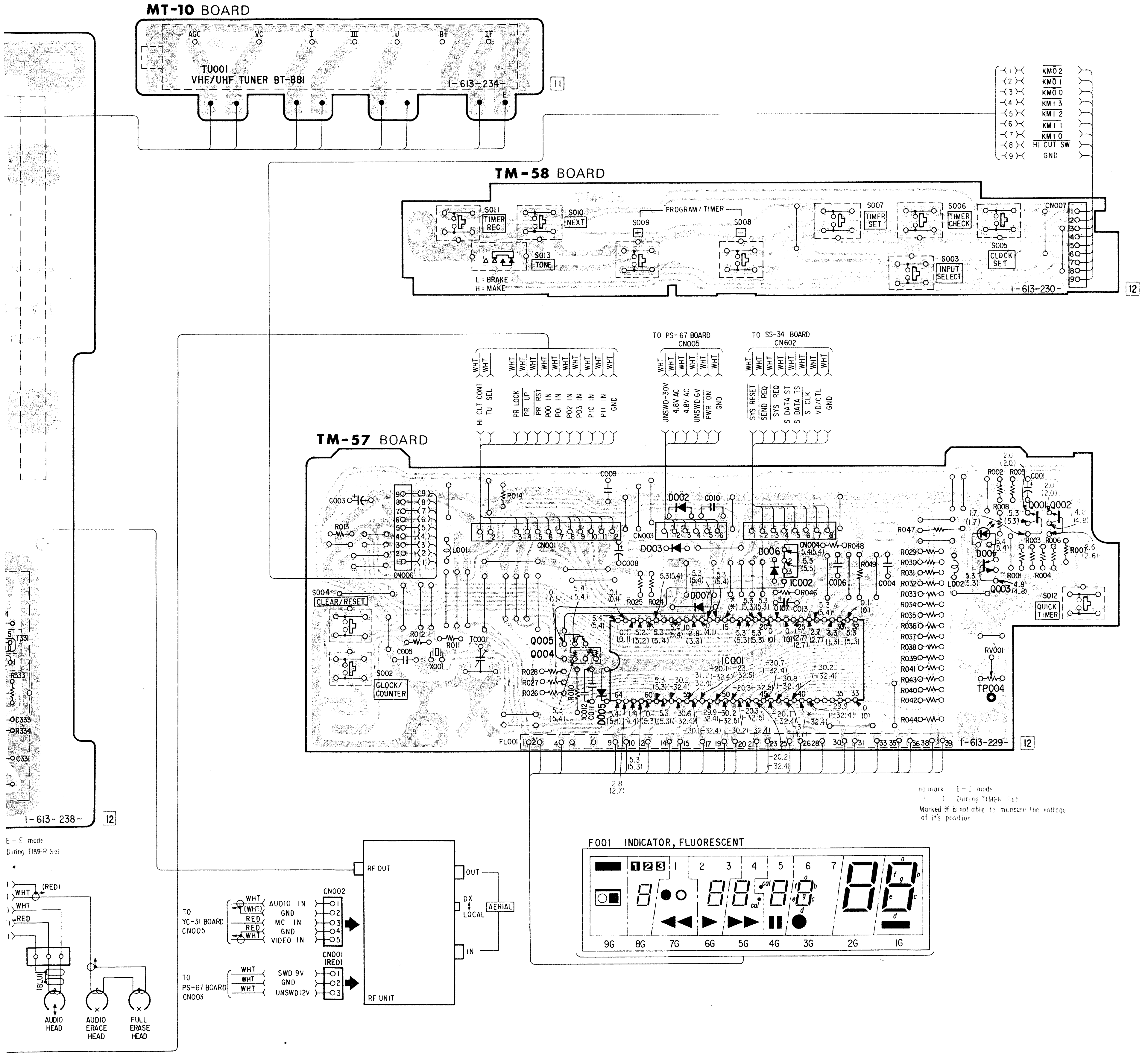
A B C D E F G H I J

Q , IC	D	ADJ, TP
IC003		
001		
006	010	
	004	
	003,002,001	RV001
005		
IC001		
IC004		
	011	
002		
		TP001
		RV301
IC006		
IC002		
IC005		
IC301		TP304
		RV331
		TP301
007		TP303
	303	
IC303 332		
003,302	009	TP305
008,004,IC302		TP302
303	013	
		TP331
		TP306
301, 331	302	
	304	
	301	
Q , IC	D	ADJ, TP

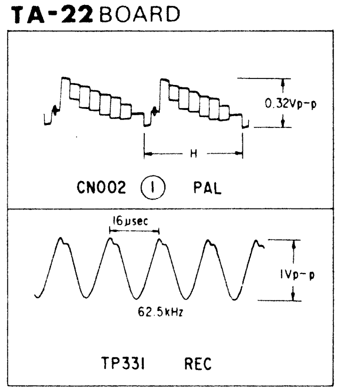

TA-22 BOARD
MT-
IC003
IC001
IC002
IC004
IC005
IC006
IC301
IC302
IC303
S001 FT(−)
S002 FT(+)
S003 SD
S004 SU
S005 AFT
S006 RESET
S007 AP
D001 D002 D003 D004 D010 D011 D013
D301 D302 D303 D304
Q001 Q002 Q003 Q004 Q005 Q006 Q007 Q008
Q301 Q302 Q303 Q331 Q332
T001 T002 T003 T004 T005
T331
SF001
CF001
CT001
CX001
PS001
RV001 RV301 RV331
TP001 TP301 TP302 TP303 TP304 TP305 TP306 TP331
TU001
VHF/UHF TUNER BT-881
IF
B+
U
III
I
VC
AGC
OVH
1-613-238-
12
CN003 (WHT)
GND
P11 OUT
P10 OUT
P03 OUT
P02 OUT
P01 OUT
P00 OUT
PR RST
PR UP
PR LOCK
TU SEL
HI CUT CONT
WHT
CN002 (BLK)
GND
COMP SYNC
TU SEL OUT
TU VIDEO OUT(G)
TU VIDEO OUT(X)
(RED) WHT ORG (WHT) WHT
TO YC-31 BOARD CN006
CN001 (WHT)
GND
UNSWD 5V
UNSWD −39V
UNSWD 39V
SWD 12V
TO PS-67 BOARD CN001
CN302 (YEL)
GND
IR IN
A MUTE
PB+AUDIO DUB
BIAS CONT
TO SS-34 BOARD CN605
CN301 (WHT)
AUDIO IN (X)
AUDIO IN (G)
AUDIO OUT(G)
AUDIO OUT(X)
WHT (RED) WHT (WHT)
TO YC-31 BOARD CN007
no mark : E-E mode
( ) : During TIMER Set
CN303 (RED)
1 ERASE HEAD (G)
2 ERASE HEAD (X)
3 AUDIO HEAD (X)
4 AUDIO HEAD (Y)
5 AUDIO HEAD (G)
(RED) WHT WHT RED (BLU)
AUDIO HEAD
AUDIO ERACE HEAD
FULL ERASE HEAD

Note:
- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- : soldering side
- : B+ pattern

When indicating parts by reference number, please include the board name.

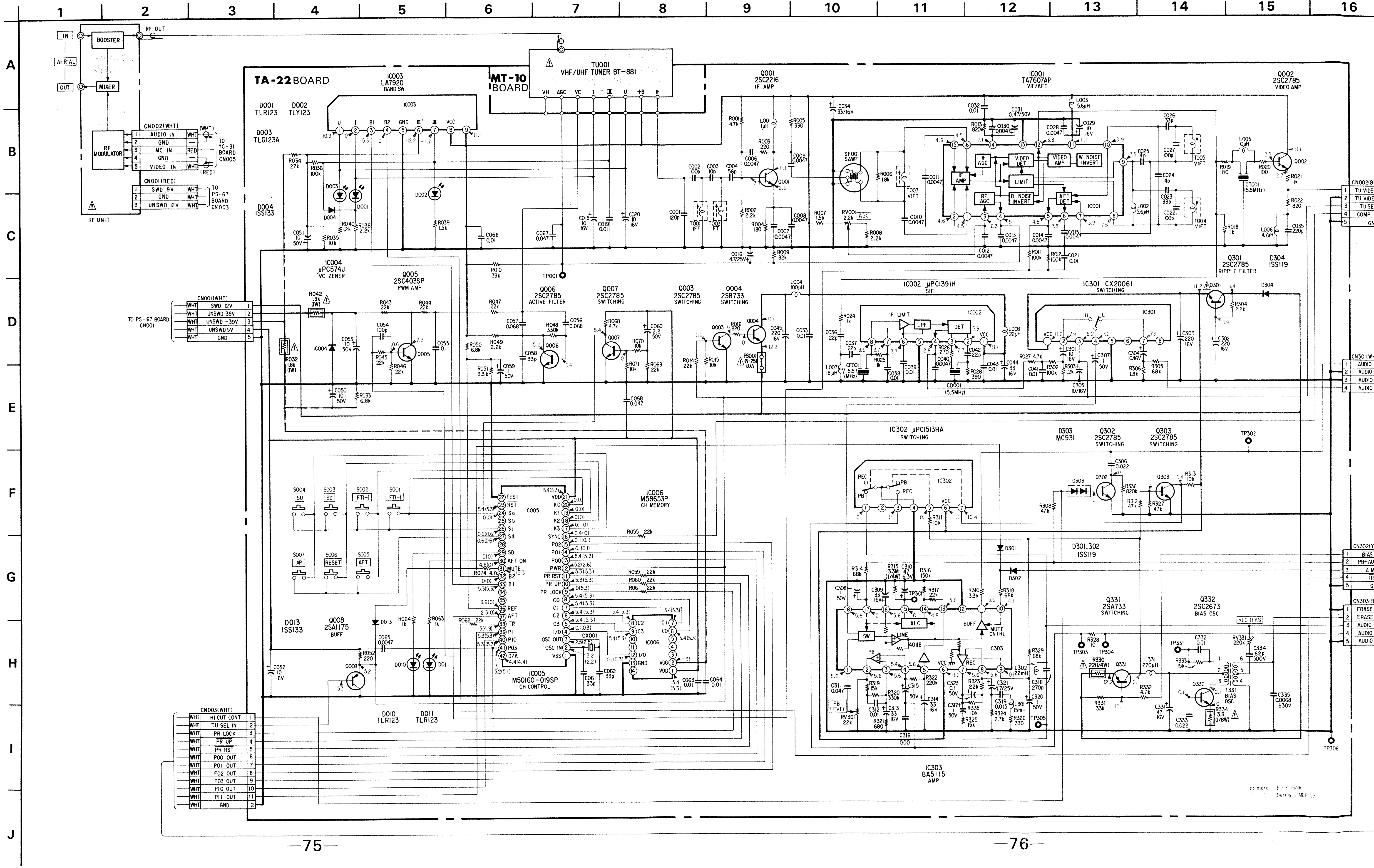

15
16
17
18
19
20
21
22
23
24
25
MT-10 BOARD
TU001
VHF/UHF TUNER BT-881
AGC
VC
B+
IF
1-613-234-
11
TM-58 BOARD
S011 TIMER REC
S010 NEXT
PROGRAM / TIMER
S009
S008
S007 TIMER SET
S006 TIMER CHECK
S005 CLOCK SET
S003 INPUT SELECT
S013 TONE
L : BRAKE
H : MAKE
CN007
KM02
KM01
KM00
KM13
KM12
KM11
KM10
HI CUT SW
GND
1-613-230-
12
TO PS-67 BOARD CN005
TO SS-34 BOARD CN602
HI CUT CONT
TU SEL
PR LOCK
PR UP
PR RST
P00 IN
P01 IN
P02 IN
P03 IN
P10 IN
P11 IN
GND
UNSWD-30V
4.8V AC
4.8V AC
UNSWD 6V
PWR ON
GND
SYS RESET
SEND REQ
SYS REQ
S DATA ST
S DATA 1S
S CLK
VD/CTL
GND
WHT
TM-57 BOARD
CN006
CN001
CN003
CN004
C003
R013
L001
C009
R014
D002
C010
D003
D006
C008
IC002
C006
C004
R047
R049
L002
R048
R046
C013
D007
R025
R024
S004 CLEAR/RESET
S002 CLOCK/COUNTER
R012
R011
C005
X001
TC001
Q005
Q004
R028
R027
R026
D005
C011
C012
IC001
D004
Q001
Q002
Q003
R001
R002
R003
R004
R005
R006
R007
R008
C001
S012 QUICK TIMER
RV001
TP004
R029
R030
R031
R032
R033
R034
R035
R036
R037
R038
R039
R041
R043
R040
R042
R044
FL001
1-613-229-
12
1-613-238-
12
E-E mode
During TIMER Set
TO YC-31 BOARD CN005
AUDIO IN
GND
MC IN
GND
VIDEO IN
CN002
TO PS-67 BOARD CN003
SWD 9V
GND
UNSWD 12V
CN001 (RED)
RF OUT
RF UNIT
OUT
DX LOCAL
AERIAL
IN
(RED)
WHT
RED
(BLU)
AUDIO HEAD
AUDIO ERACE HEAD
FULL ERASE HEAD
F001 INDICATOR, FLUORESCENT
9G
8G
7G
6G
5G
4G
3G
2G
1G

no mark E-E mode
( ) During TIMER Set
Marked * is not able to measure the voltage of it's position



TA-22 (VIF, AFT, SIF, AUTO PROGRAM AUDIO), MT-10 (TUNER), TM-57 (TIMER INDICATOR), TM-58 (SWITCH) SCHEMATIC DIAGRAM

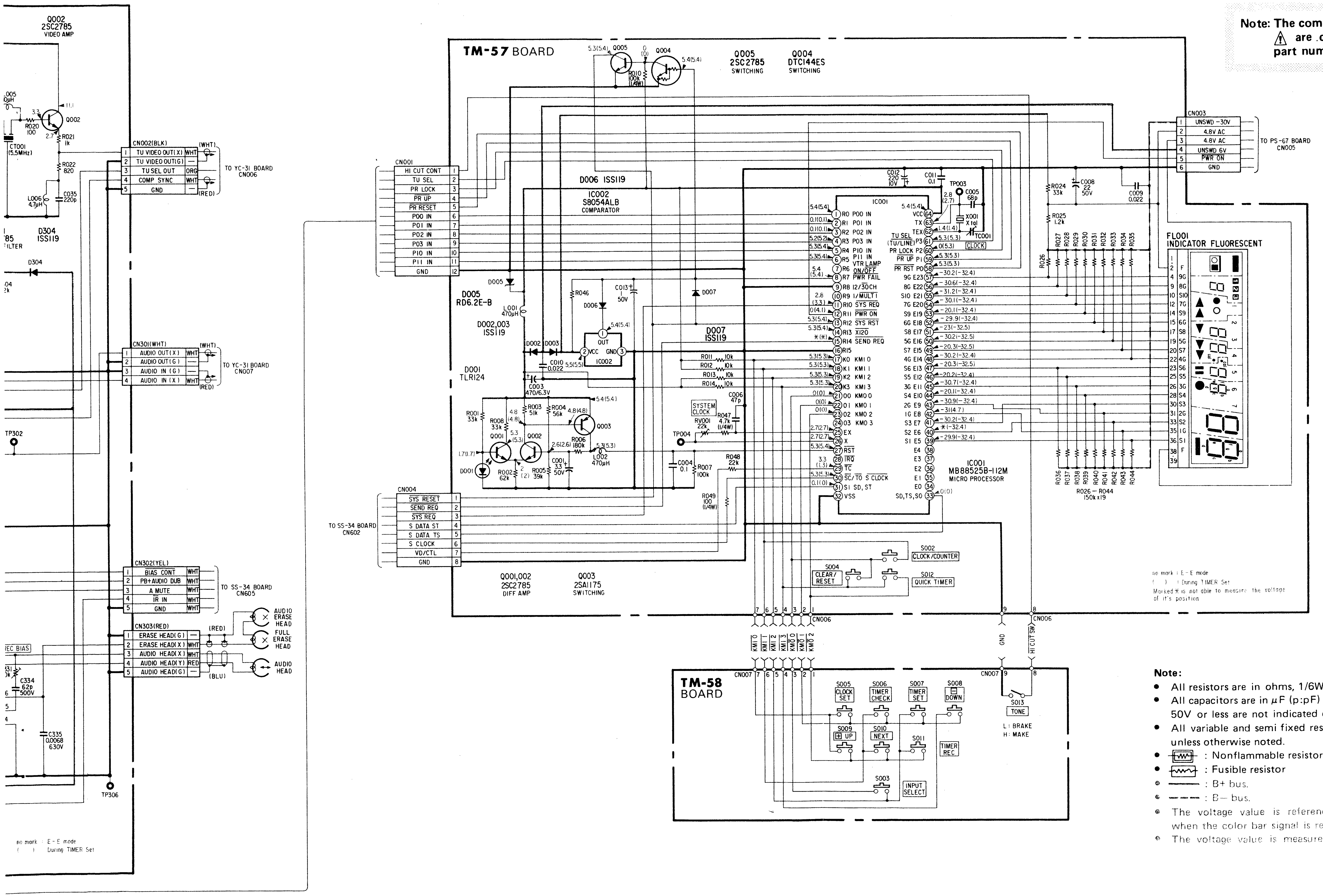
– Ref. No. TA-22, MT-10 BOARD : 5000 series, TM-57, TM-58 BOARD : 6000 series –


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I J
RF UNIT
IN
AERIAL
OUT
BOOSTER
MIXER
RF OUT
RF MODULATOR
CN002(WHT)
AUDIO IN
GND
MC IN
VIDEO IN
TO YC-31 BOARD CN005
CN001(RED)
SWD 9V
UNSWD 12V
TO PS-67 BOARD CN003
TA-22 BOARD
MT-10 BOARD
TU001 VHF/UHF TUNER BT-881
IC003 LA7920 BAND SW
D001 TLR123
D002 TLY123
D003 TLG123A
D004 ISS133
IC004 μPC574J VC ZENER
Q005 2SC403SP PWM AMP
Q006 2SC2785 ACTIVE FILTER
Q007 2SC2785 SWITCHING
Q003 2SC2785 SWITCHING
Q004 2SB733 SWITCHING
Q001 2SC2216 IF AMP
IC001 TA7607AP VIF/AFT
Q002 2SC2785 VIDEO AMP
SF001 SAWF
T003 VIFT
T004 VIFT
T005 VIFT
IF AMP
RF AGC
IF AGC
VIDEO DET
VIDEO AMP
W NOISE INVERT
LIMIT
B NOISE INVERT
AFT DET
CT001 (5.5MHz)
CD001 (5.5MHz)
IC002 μPC1391H SIF
IF LIMIT
LPF
DET
IC301 CX20061 SWITCHING
Q301 2SC2785 RIPPLE FILTER
D304 ISS119
PS001 (N-25) 1.0A
TP001
CN001(WHT)
SWD 12V
UNSWD 39V
UNSWD -39V
UNSWD 5V
GND
TO PS-67 BOARD CN001
S004 SU
S003 SD
S002 FT(+)
S001 FT(-)
S007 AP
S006 RESET
S005 AFT
IC005 M50160-019SP CH CONTROL
IC006 M58653P CH MEMORY
CX001
Q008 2SA1175 BUFF
D013 ISS133
D010 TLR123
D011 TLR123
CN003(WHT)
HI CUT CONT
TU SEL IN
PR LOCK
PR UP
PR RST
P00 OUT
P01 OUT
P02 OUT
P03 OUT
P10 OUT
P11 OUT
GND
IC302 μPC1513HA SWITCHING
D303 MC931
Q302 2SC2785 SWITCHING
Q303 2SC2785 SWITCHING
TP302
D301,302 ISS119
IC303 BA5115 AMP
ALC
SW
LINE
40dB
BUFF
MUTE CNTRL
PB LEVEL
RV301
TP301
TP303
TP304
TP305
TP306
TP331
Q331 2SA733 SWITCHING
Q332 2SC2673 BIAS OSC
REC BIAS
T331 BIAS OSC
CN002(B)
TU VIDE
TU SE
COMP
CN301(W)
AUDIO
CN302(Y)
BIAS
PB+AU
CN303(R)
ERASE
AUDIO

no mark : E - E mode
( ) : During TIMER Set

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.


TM-57 BOARD
TM-58 BOARD
IC001 MB88525B-112M MICRO PROCESSOR
IC002 S8054ALB COMPARATOR
Q005 2SC2785 SWITCHING
Q004 DTC144ES SWITCHING
Q001,002 2SC2785 DIFF AMP
Q003 2SA1175 SWITCHING
Q002 2SC2785 VIDEO AMP
D001 TLR124
D005 RD6.2E-B
D002,003 ISS119
D006 ISS119
D007 ISS119
FL001 INDICATOR FLUORESCENT
R026 – R044 150k x 19
CN001
CN002(BLK)
CN003
CN004
CN006
CN007
CN301(WHT)
CN302(YEL)
CN303(RED)
TO YC-31 BOARD CN006
TO YC-31 BOARD CN007
TO SS-34 BOARD CN605
TO SS-34 BOARD CN602
TO PS-67 BOARD CN005
AUDIO ERASE HEAD
FULL ERASE HEAD
AUDIO HEAD
S002 CLOCK/COUNTER
S004 CLEAR/RESET
S012 QUICK TIMER
S005 CLOCK SET
S006 TIMER CHECK
S007 TIMER SET
S008 DOWN
S009 UP
S010 NEXT
S011 TIMER REC
S003 INPUT SELECT
S013 TONE
L: BRAKE
H: MAKE
SYSTEM CLOCK
TP004
TP302
TP306
no mark : E-E mode
( ) : During TIMER Set
Marked ※ is not able to measure the voltage of it's position

Note:
- All resistors are in ohms, 1/6W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted.
  50V or less are not indicated except for electrolytic capacitors.
- All variable and semi fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : Nonflammable resistor
- ▭ : Fusible resistor
- ——— : B+ bus.
- – – – : B– bus.
- The voltage value is reference value between the grounding when the color bar signal is received from a color bar generator.
- The voltage value is measured using a digital tester (10MΩ).

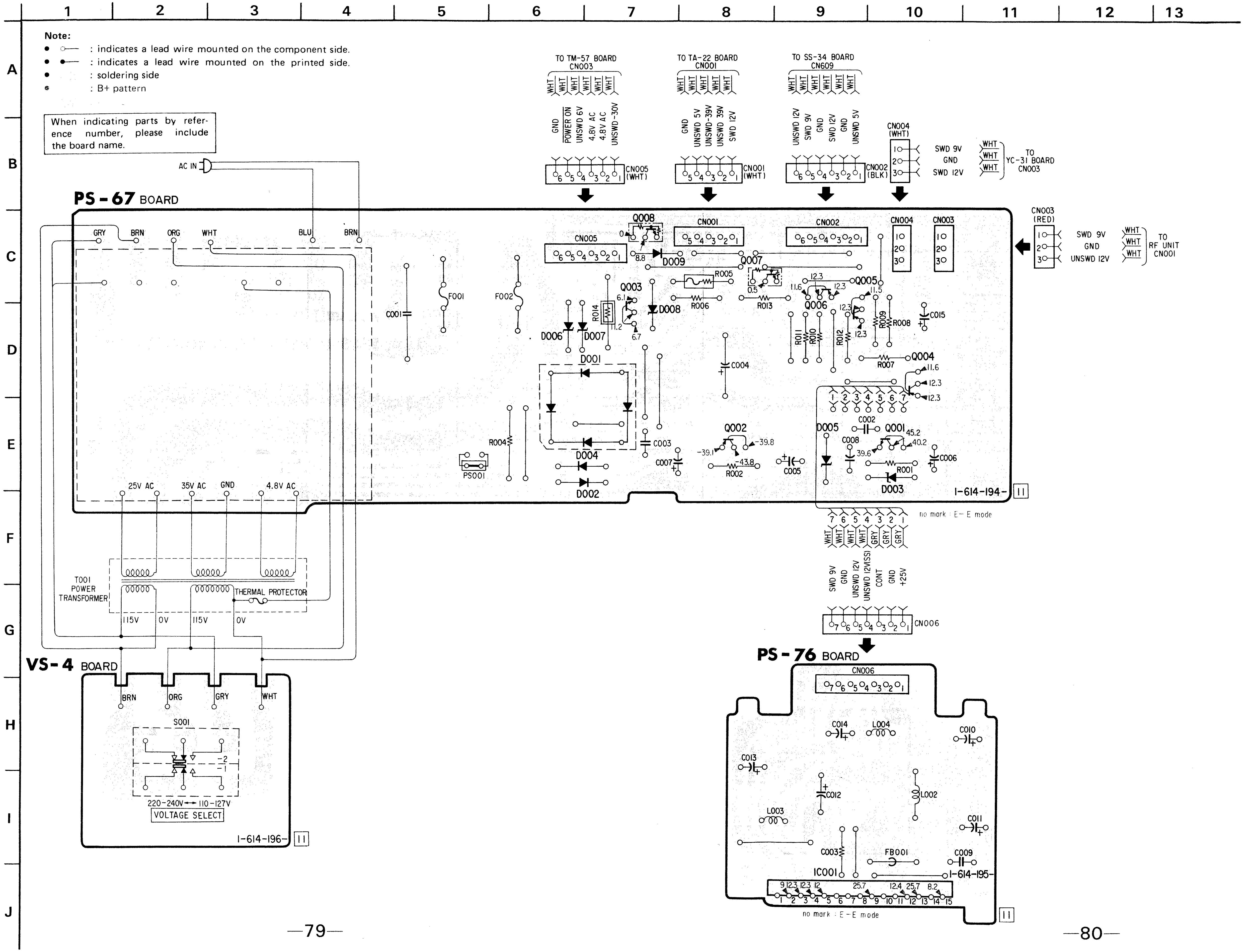
4-5. PS-67 (POWER SUPPLY), PS-76 (REGULATOR), VS-4 (VOLTAGE SELECTOR) PRINTED WIRING BOARDS

– Ref. No. PS-67 BOARD : 7000 series, PS-76, VS-4 BOARD : 7100 series –

Note:

- ○— : indicates a lead wire mounted on the component side.
- ●— : indicates a lead wire mounted on the printed side.
- : soldering side
- : B+ pattern

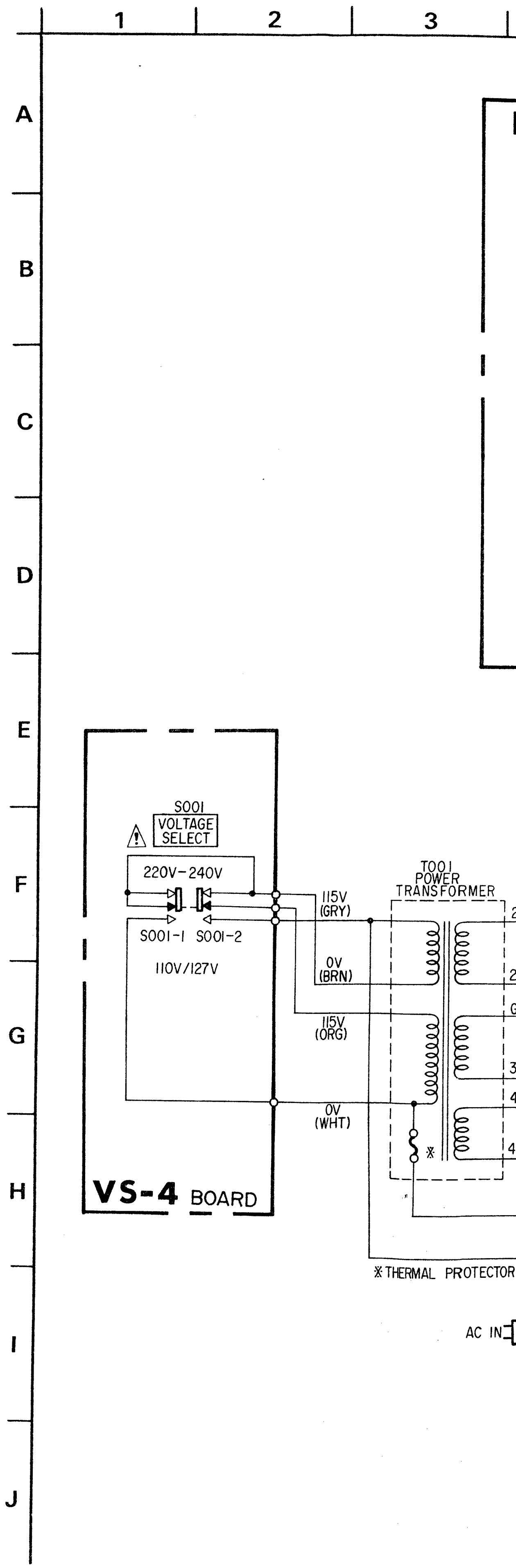
When indicating parts by reference number, please include the board name.



1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
J
TO TM-57 BOARD CN003
WHT
GND
POWER ON
UNSWD 6V
4.8V AC
4.8V AC
UNSWD -30V
CN005 (WHT)
TO TA-22 BOARD CN001
GND
UNSWD 5V
UNSWD -39V
UNSWD 39V
SWD 12V
CN001 (WHT)
TO SS-34 BOARD CN609
UNSWD 12V
SWD 9V
GND
SWD 12V
GND
UNSWD 5V
CN002 (BLK)
CN004 (WHT)
SWD 9V
GND
SWD 12V
TO YC-31 BOARD CN003
CN003 (RED)
SWD 9V
GND
UNSWD 12V
TO RF UNIT CN001
AC IN
PS-67 BOARD
GRY
BRN
ORG
WHT
BLU
BRN
CN005
CN001
CN002
CN004
CN003
Q008
D009
Q007
R005
Q003
R014
D008
R006
R013
Q005
Q006
C015
R008
R009
R011
R010
R012
Q004
R007
D006
D007
D001
C001
F001
F002
C004
Q002
R002
C005
R004
C003
C007
D004
D002
PS001
D005
C002
Q001
C008
C006
R001
D003
1-614-194-
11
25V AC
35V AC
GND
4.8V AC
T001 POWER TRANSFORMER
THERMAL PROTECTOR
115V
0V
115V
0V
no mark : E-E mode
SWD 9V
GND
UNSWD 12V
UNSWD 12V(SS)
CONT
GND
+25V
CN006
VS-4 BOARD
BRN
ORG
GRY
WHT
S001
220-240V ←→ 110-127V
VOLTAGE SELECT
1-614-196-
PS-76 BOARD
CN006
C014
L004
C010
C013
C012
L002
L003
C011
C003
FB001
C009
IC001
1-614-195-
no mark : E-E mode

PS-67 (POWER SUPPLY), PS-76 (REGULATOR),

– Ref. No. PS-67 BOARD : 7000 series, PS-76, VS-4 BOARD



1
2
3
A
B
C
D
E
F
G
H
I
J
S001
VOLTAGE SELECT
220V-240V
S001-1
S001-2
110V/127V
115V (GRY)
0V (BRN)
115V (ORG)
0V (WHT)
T001 POWER TRANSFORMER
VS-4 BOARD
※THERMAL PROTECTOR
AC IN

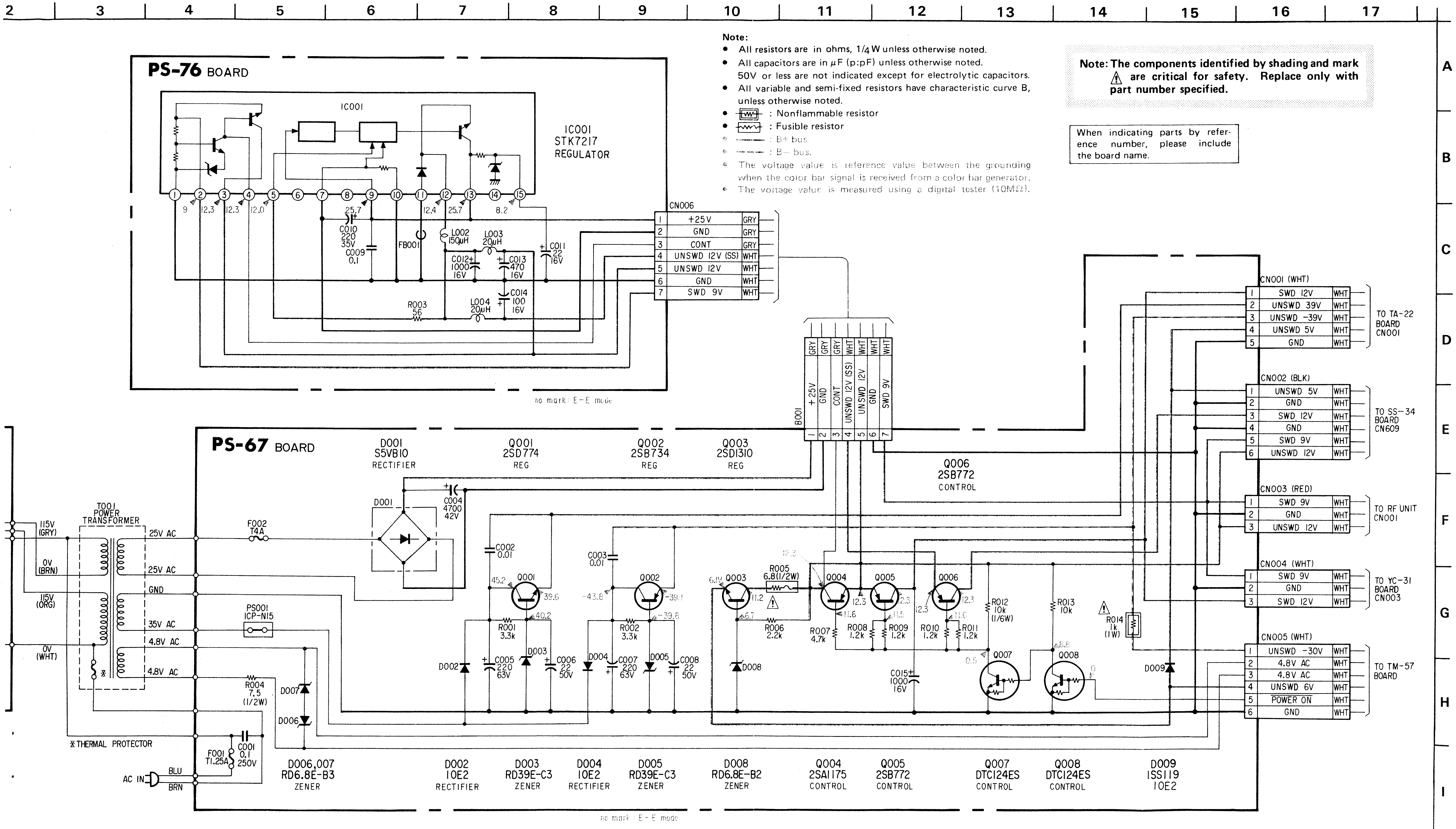
Y), PS-76 (REGULATOR), VS-4 (VOLTAGE SELECTOR) SCHEMATIC DIAGRAM

7000 series, PS-76, VS-4 BOARD : 7100 series –

Note:
- All resistors are in ohms, 1/4 W unless otherwise noted.
- All capacitors are in µF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- All variable and semi-fixed resistors have characteristic curve B, unless otherwise noted.
- ▭ : Nonflammable resistor
- ▭ : Fusible resistor
- ——— : B+ bus.
- – – – : B– bus.
- The voltage value is referance value between the grounding when the color bar signal is received from a color bar generator.
- The voltage value is measured using a digital tester (10MΩ).

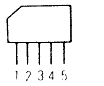
Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

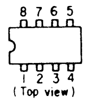

2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
A B C D E F G H I J
PS-76 BOARD
IC001
IC001 STK7217 REGULATOR
9 12.3 12.3 12.0 25.7 12.4 25.7 8.2
C010 220 35V
C009 0.1
FB001
L002 150µH
L003 20µH
C012 1000 16V
C013 470 16V
C011 22 16V
C014 100 16V
R003 56
L004 20µH
CN006
1 +25V GRY
2 GND GRY
3 CONT GRY
4 UNSWD 12V (SS) WHT
5 UNSWD 12V WHT
6 GND WHT
7 SWD 9V WHT
no mark : E–E mode
B001
GRY GRY GRY WHT WHT WHT WHT
+25V GND CONT UNSWD 12V (SS) UNSWD 12V GND SWD 9V
1 2 3 4 5 6 7
PS-67 BOARD
D001 S5VB10 RECTIFIER
Q001 2SD774 REG
Q002 2SB734 REG
Q003 2SD1310 REG
Q006 2SB772 CONTROL
T001 POWER TRANSFORMER
115V (GRY)
0V (BRN)
115V (ORG)
0V (WHT)
25V AC
25V AC
GND
35V AC
4.8V AC
4.8V AC
F002 T4A
D001
C004 4700 42V
PS001 ICP-N15
R004 7.5 (1/2W)
D007
D006
※THERMAL PROTECTOR
AC IN
BLU
BRN
F001 T1.25A
C001 0.1 250V
C002 0.01
45.2 Q001 39.6 40.2
R001 3.3k
D002
C005 220 63V
D003
C006 22 50V
C003 0.01
-43.8 Q002 -39.1 -39.6
R002 3.3k
D004
C007 220 63V
D005
C008 22 50V
6.1V Q003 11.2 6.7
R005 6.8(1/2W)
R006 2.2k
D008
12.3
Q004 12.3 11.6
Q005 12.3 11.5
Q006 12.3 11.6
R007 4.7k
R008 1.2k
R009 1.2k
R010 1.2k
R011 1.2k
R012 10k (1/6W)
R013 10k
R014 1k (1W)
C015 1000 16V
Q007 0.5
Q008 4.8
D009
D006,007 RD6.8E-B3 ZENER
D002 10E2 RECTIFIER
D003 RD39E-C3 ZENER
D004 10E2 RECTIFIER
D005 RD39E-C3 ZENER
D008 RD6.8E-B2 ZENER
Q004 2SA1175 CONTROL
Q005 2SB772 CONTROL
Q007 DTC124ES CONTROL
Q008 DTC124ES CONTROL
D009 1SS119 10E2
no mark : E–E mode
CN001 (WHT)
1 SWD 12V WHT
2 UNSWD 39V WHT
3 UNSWD -39V WHT
4 UNSWD 5V WHT
5 GND WHT
TO TA-22 BOARD CN001
CN002 (BLK)
1 UNSWD 5V WHT
2 GND WHT
3 SWD 12V WHT
4 GND WHT
5 SWD 9V WHT
6 UNSWD 12V WHT
TO SS-34 BOARD CN609
CN003 (RED)
1 SWD 9V WHT
2 GND WHT
3 UNSWD 12V WHT
TO RF UNIT CN001
CN004 (WHT)
1 SWD 9V WHT
2 GND WHT
3 SWD 12V WHT
TO YC-31 BOARD CN003
CN005 (WHT)
1 UNSWD -30V WHT
2 4.8V AC WHT
3 4.8V AC WHT
4 UNSWD 6V WHT
5 POWER ON WHT
6 GND WHT
TO TM-57 BOARD

4-6. SEMICONDUCTORS

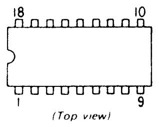
BA634



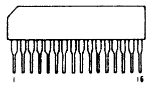
BA4558
HA17558
LM358P
NJM4558D
µPC358C
µPC4558C


8 7 6 5
1 2 3 4
(Top view)

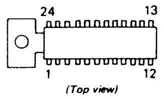
BA5115


18
10
1
9
(Top view)

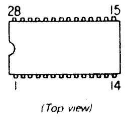
BA7007



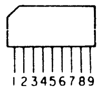
CX134A


24
13
1
12
(Top view)

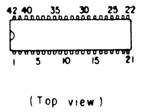
CX862
CX866A
CX866B


28
15
1
14
(Top view)

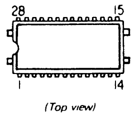
CX894
LA7205
LA7920



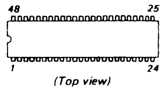
CX10021A-P
CX10021A-NP
CX10021B-P
CX10021B-NP
CX194B-0
CX194B-5
M50160-019SP


42 40 35 30 25 22
1 5 10 15 21
(Top view)

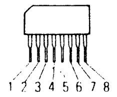
CX10023


28
15
1
14
(Top view)

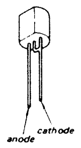
CX20043


48
25
1
24
(Top view)

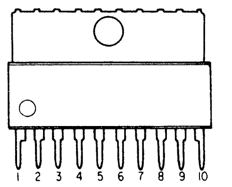
CX20061
µPC1373H
µPC1373HA
µPC1391H



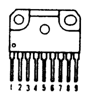
HZT33-02
µPC574J


anode
cathode

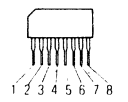
LB1640N


1 2 3 4 5 6 7 8 9 10

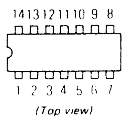
M54543L



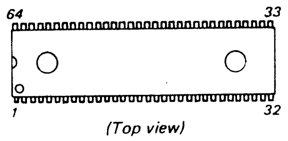
M54570L



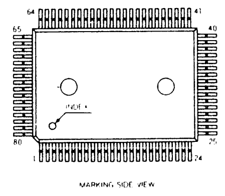
M58653P
MB3614
µPC324C


14 13 12 11 10 9 8
1 2 3 4 5 6 7
(Top view)

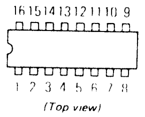
MB88525B-112M


64
33
1
32
(Top view)

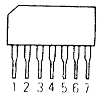
MB88551-133M


64
41
40
65
80
25
1
24
MARKING SIDE VIEW

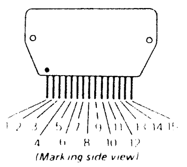
MB84053B
TA7607AP
TC4053BP
µPD4053BC


16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8
(Top view)

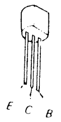
µPC1513HA



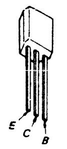
STK7217


1 2 3 5 7 9 11 13 14 15
4 6 8 10 12
(Marking side view)

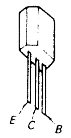
2SA733-P
2SA844-C
2SA844-D
2SA844-E
2SC1740S



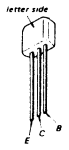
2SA933S
2SA1048
2SA1048-GR
2SA1115
2SC403SP
2SC403SP-3
2SC2458
2SC2603
2SD1310
DTA114ES
DTA144ES
DTC124ES
DTC144ES
DTC144WS



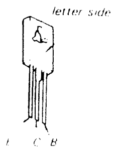
2SA1026



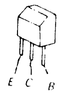
2SA1150
2SA1175
2SC2785


letter side
E C B

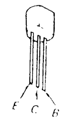
2SB772


letter side
E C B

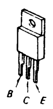
2SB733
2SD773
2SD774



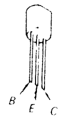
2SB739
2SC1474
2SC1475-13
2SD788
2SD789



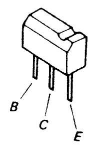
2SC1061
2SC1826
2SC1827
2SD313HP



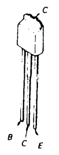
2SC2216
2SC2717



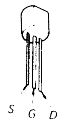
2SC2673



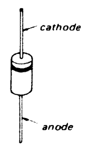
2SD1164



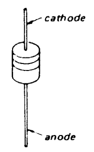
2SK107-2
2SK105A



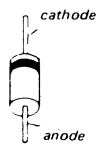
10E2
ERB12-02RK


cathode
anode

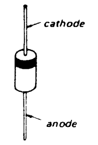
1SS119
1SS133
1SS148


cathode
anode

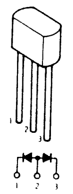
EQA02-07A
EQA02-07B2
EQA02-09D
EQA02-10A
EQA02-10B
HZ10E-B1
HZ10E-B2
HZ10E-B3
HZ6.8E-B2
HZ6.8E-B3
RD10E-B1
RD10E-B2
RD10E-B3
RD39E-C3
RD39J-N3
RD5.1E-B1
RD5.1E-L1
RD5.1E-L2
RD5.1E-L3
RD6.2E-B
RD6.8E-B2
RD6.8E-B3


cathode
anode

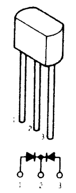
GP08D


cathode
anode

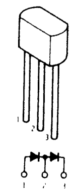
MC911



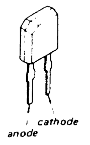
MC921



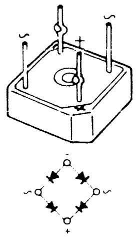
MC931



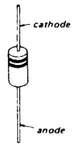
PH302B


cathode
anode

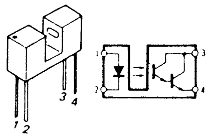
S5VB10



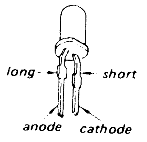
SIB01-02


cathode
anode

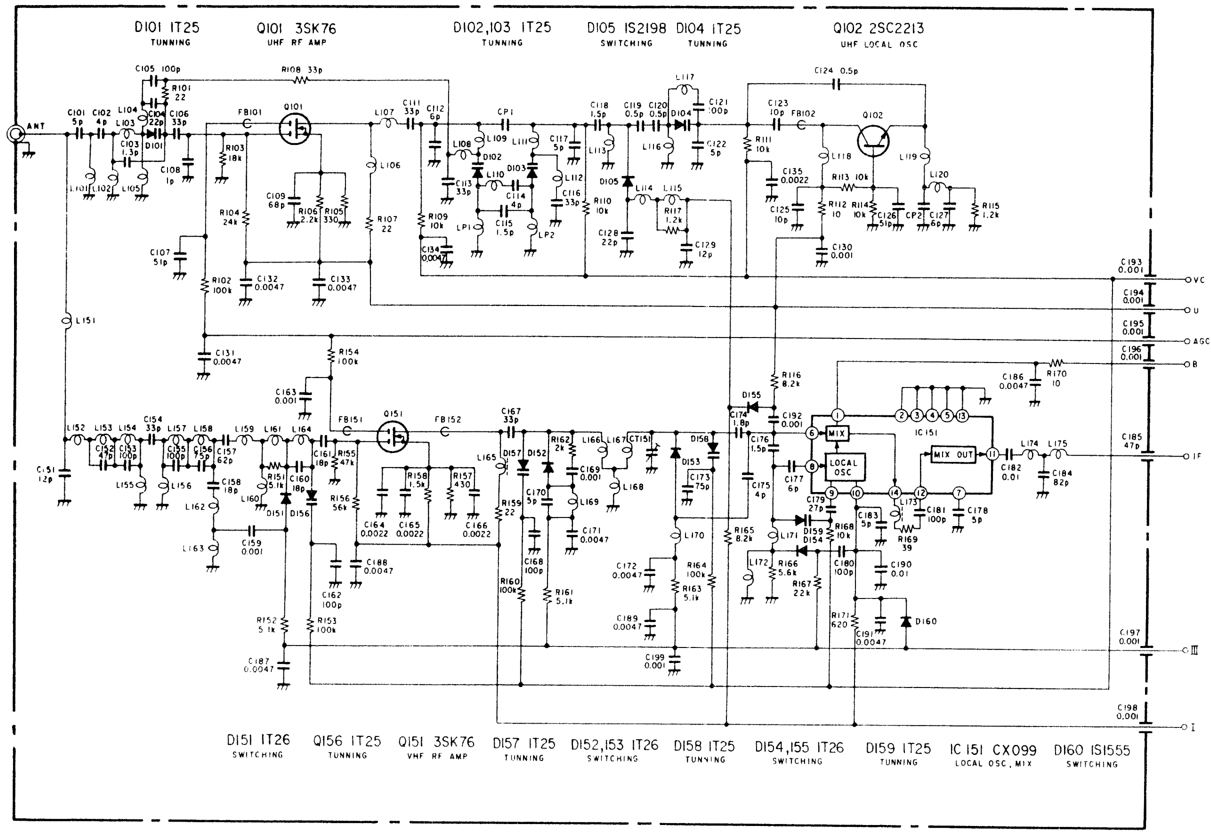
SPI201-22



TLG123A
TLR123
TLR124
TLY123


long
short
anode
cathode

4-7. UHF AND VHF TUNER SCHEMATIC DIAGRAM
– BT-881 tuner –


D101 1T25
TUNNING
Q101 3SK76
UHF RF AMP
D102,103 1T25
TUNNING
D105 1S2198
SWITCHING
D104 1T25
TUNNING
Q102 2SC2213
UHF LOCAL OSC
ANT
VC
U
ASC
B
IF
III
I
IC151
MIX
LOCAL OSC
MIX OUT
D151 1T26
SWITCHING
Q156 1T25
TUNNING
Q151 3SK76
VHF RF AMP
D157 1T25
TUNNING
D152,153 1T26
SWITCHING
D158 1T25
TUNNING
D154,155 1T26
SWITCHING
D159 1T25
TUNNING
IC 151 CX099
LOCAL OSC, MIX
D160 1S1555
SWITCHING

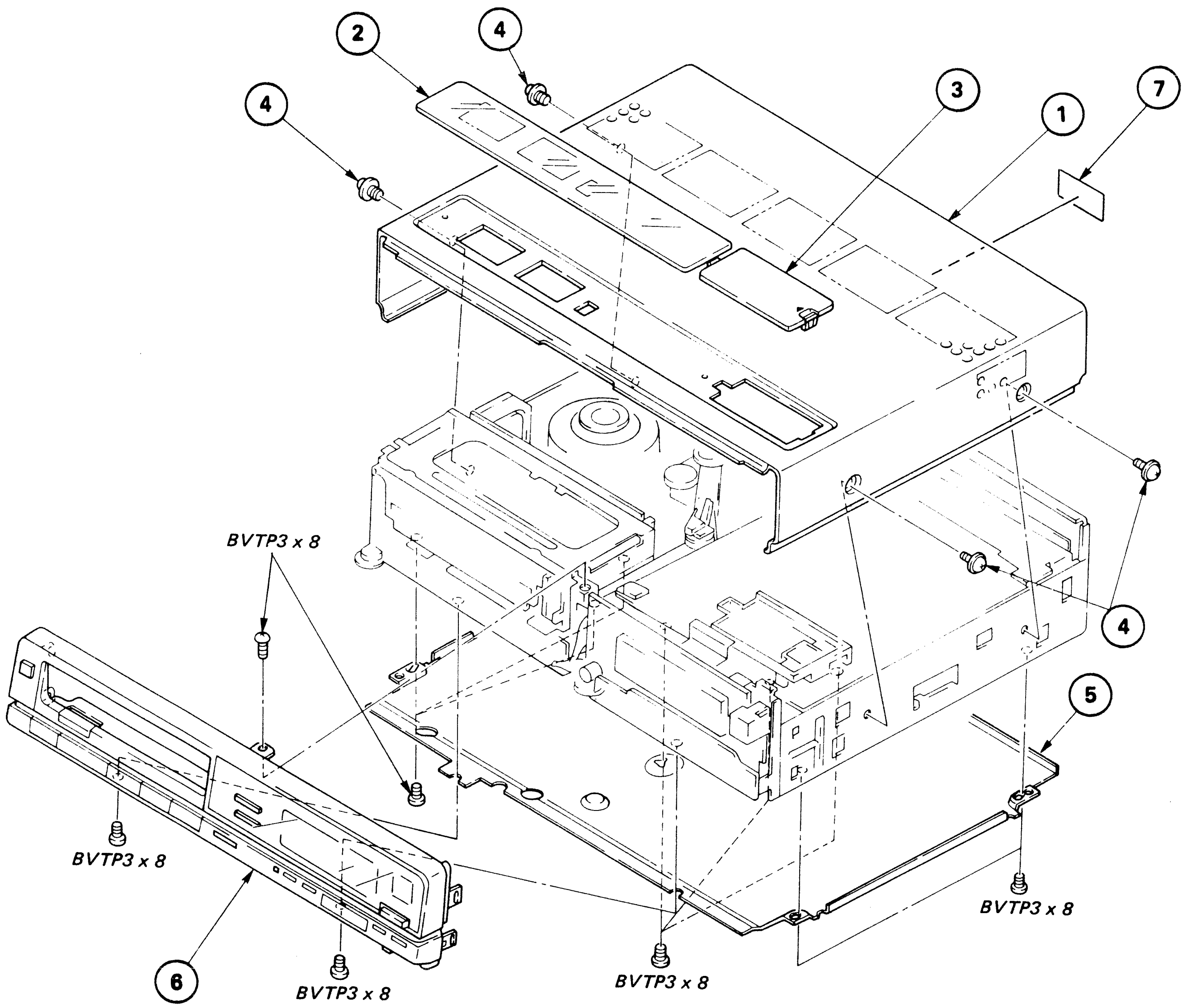
Note: Tuner reference number are not included in the Electrical Parts List.

SECTION 5
EXPLODED VIEWS

NOTE:
- Itmes with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

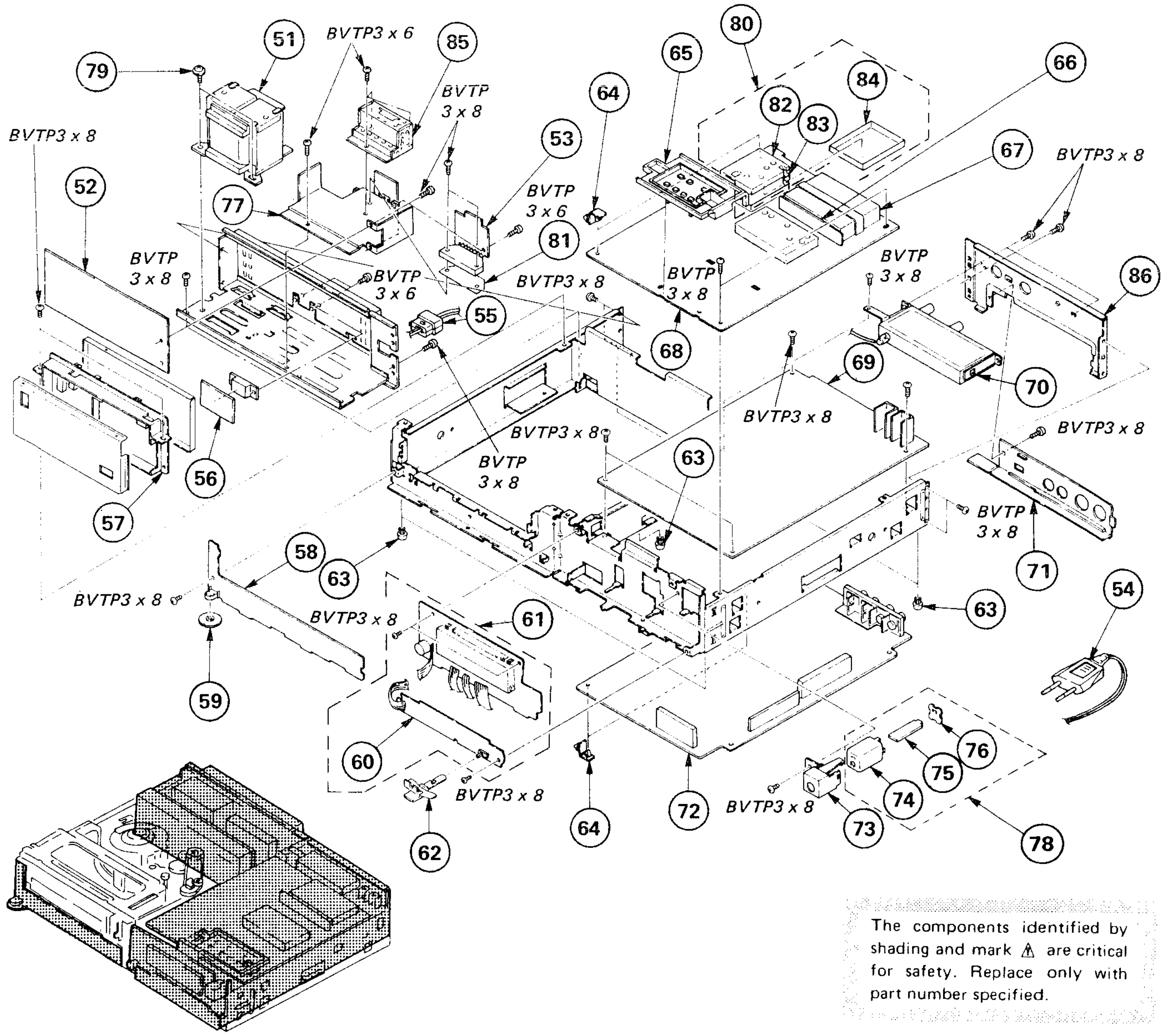
The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

5-1. FRONT PANEL AND CABINET ASSEMBLIES


2
4
3
1
7
4
4
5
6
BVTP3 x 8
BVTP3 x 8
BVTP3 x 8
BVTP3 x 8
BVTP3 x 8

No.	Part No.	Description	Remark
1	X-3684-162-1	CASE ASSY, UPPER (RED)	2
	X-3684-163-1	CASE ASSY, UPPER (SILVER)	2
	X-3687-504-1	CASE ASSY, UPPER (GRAY)	2
2	3-684-184-01	PLATE, TRANSPARENT	
3	X-3684-146-1	LID ASSY, PRESET	
4	4-886-821-01	SCREW, M3 CASE (GRAY MODEL)	
	4-886-821-11	SCREW, M3 CASE (SILVER, RED MODEL)	
5	*3-684-219-01	PLATE BOTTOM	
6	X-3687-529-1	PANEL ASSY, FRONT (GRAY)	
	X-3687-530-1	PANEL ASSY, FRONT (RED)	
	X-3687-531-1	PANEL ASSY, FRONT (SILVER)	
7	*3-687-554-01	LABEL, MODEL NUMBER	

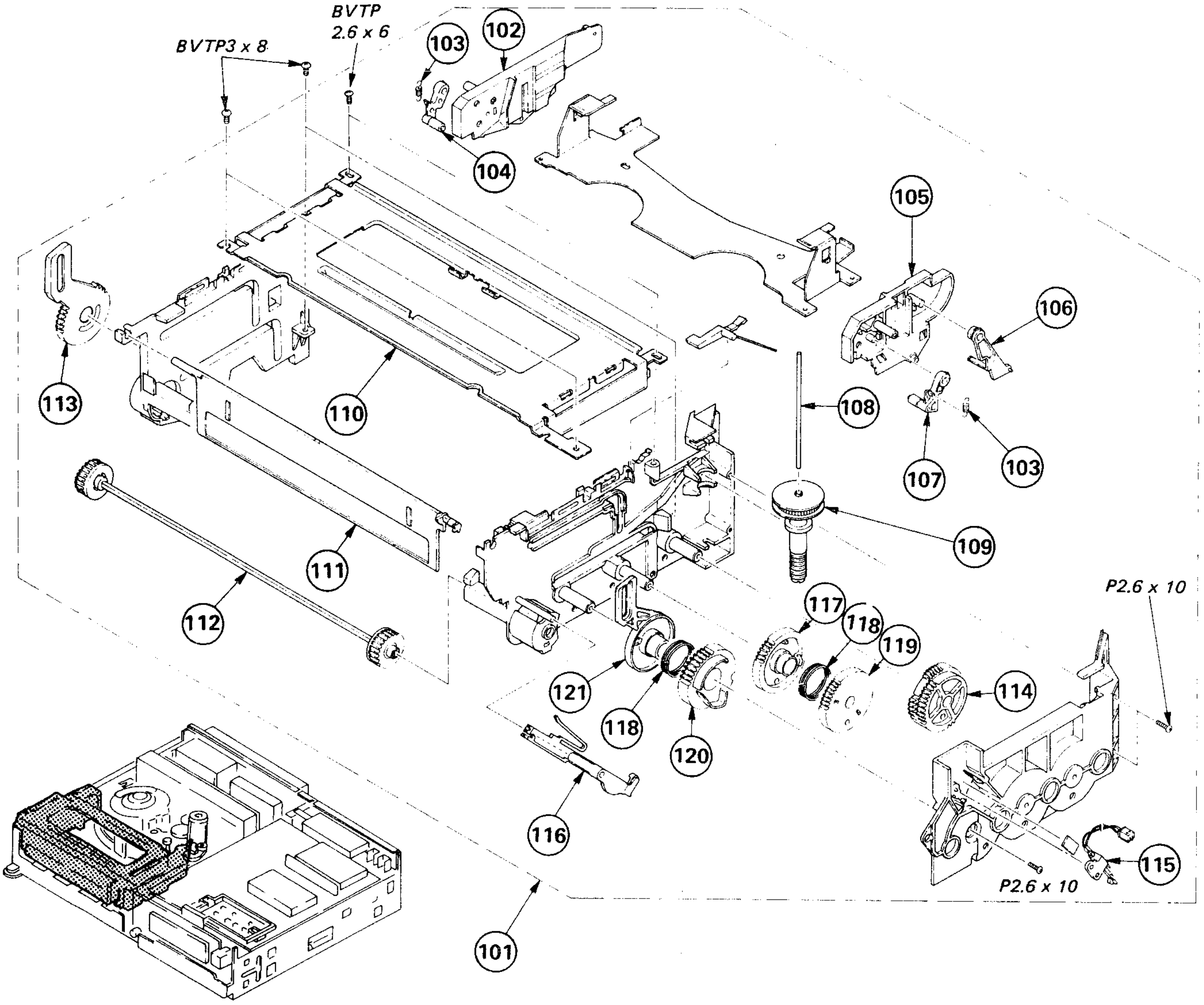
5-2. TUNER, TIMER AND POWER ASSEMBLIES


(51)
BVTP3 x 6
(85)
(80)
(65)
(66)
(79)
BVTP 3 x 8
(84)
(64)
(82)
(83)
BVTP3 x 8
(53)
(67)
BVTP3 x 8
(52)
BVTP 3 x 6
(77)
(81)
BVTP 3 x 8
BVTP 3 x 8
BVTP 3 x 6
BVTP3 x 8
BVTP 3 x 8
BVTP 3 x 8
(86)
(55)
(68)
(69)
(70)
BVTP3 x 8
BVTP3 x 8
BVTP3 x 8
(56)
BVTP 3 x 8
(63)
(57)
BVTP 3 x 8
(58)
(63)
(71)
(54)
BVTP3 x 8
(61)
(63)
BVTP3 x 8
(59)
(76)
(60)
(75)
BVTP3 x 8
(74)
(72)
BVTP3 x 8
(64)
(73)
(78)
(62)

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

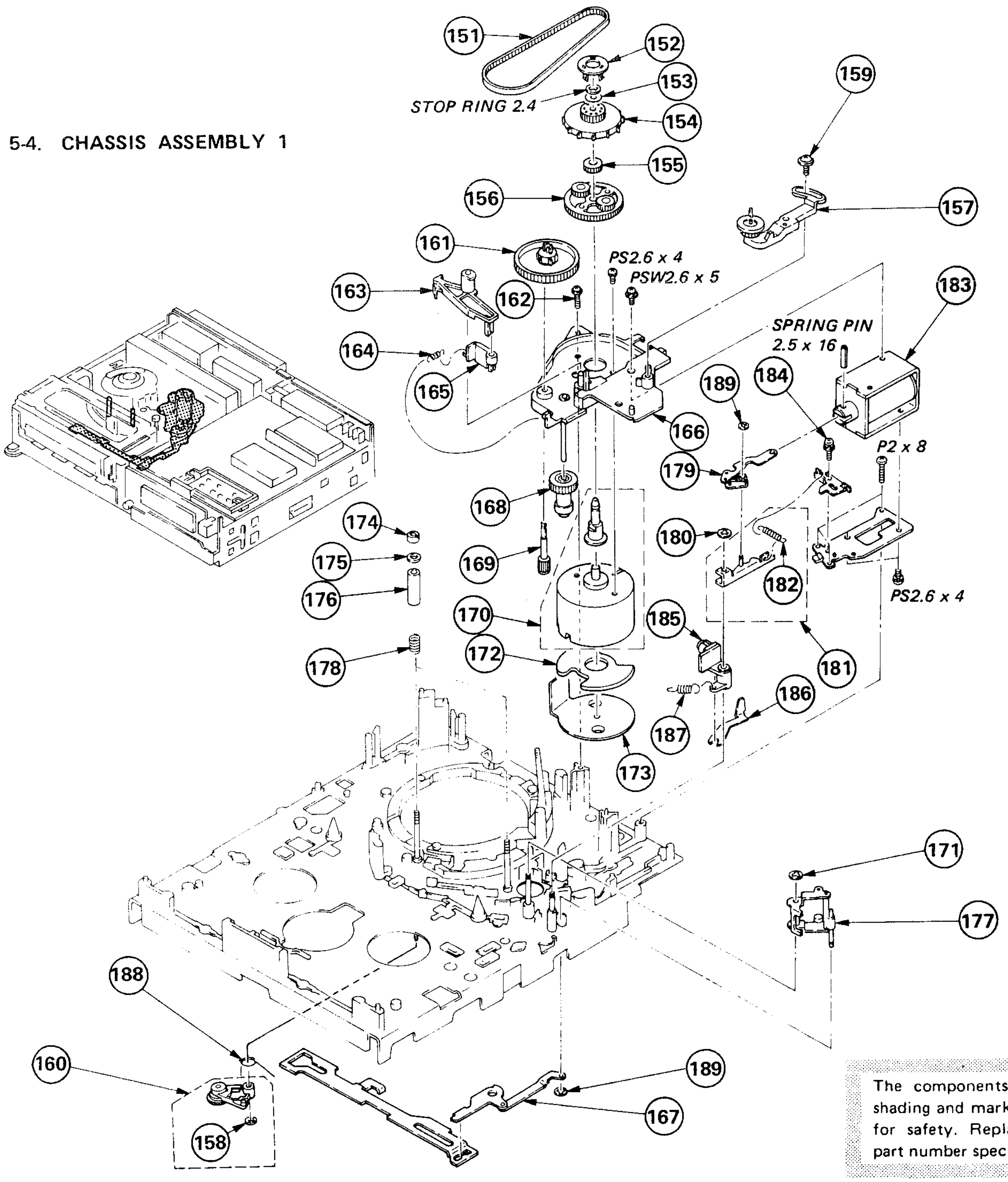
No.	Part No.	Description	Remark
51	⚠.1-447-985-11	TRANSFORMER, POWER (T901)	
52	*A-6729-106-A	PS-67 BOARD, COMPLETE	
53	*1-614-195-11	PS-76 BOARD	
54	⚠.1-551-908-11	CORD, POWER	
55	⚠.3-703-244-02	BUSHING, CORD	
56	*1-614-196-11	VS-4 BOARD	
57	*A-6711-565-A	RP-20 BOARD, COMPLETE	
58	*1-613-231-12	FU-25 BOARD	
59	3-684-103-11	KNOB, TRACK CONTROL	
60	*1-613-230-12	TM-58 BOARD	
61	*A-6707-468-A	TM BOARD, COMPLETE	60
62	3-684-270-11	BUTTON, SELECTION, INPUT	
63	3-670-155-11	LEG	
64	*3-701-832-00	HINGE, CIRCUIT BOARD	
65	X-3687-501-1	COVER ASSY, PRESET	
66	*1-613-234-11	MT-10 BOARD	
67	⚠.1-463-350-12	TUNER, ET (BT-881)	
68	*A-6721-222-A	TA-22 BOARD, COMPLETE	66, 67, 80
69	*A-6715-239-A	SS-34 BOARD, COMPLETE	
70	⚠.1-464-386-21	BOOSTER MIXER, RF MODULATOR (RFU-819)	
71	*3-687-535-01	PLATE, CONNECTOR	
72	*A-6711-566-A	YC-31 BOARD, COMPLETE	
73	*3-684-182-01	FRAME, FITTING, RAY CATCHER	
74	*4-342-117-00	CASE, SHIELD (MAIN), R	
75	*1-606-794-00	N BOARD	
76	*4-342-118-00	LID, SHIELD CASE, R	
77	*3-687-595-01	HEAT SINK	
78	A-6734-213-A	CATCHER BLOCK ASSY, RAY	74-76
79	4-886-821-11	SCREW, M3 CASE	
80	*X-3687-527-1	LID ASSY, BOTTOM, SHIELD CASE, AU	82-84
81	3-687-592-01	SHEET, RADIATION	
82	*3-687-550-01	CASE (UPPER LID), SHIELD, AU	
83	*3-687-558-01	CASE (MAIN), SHIELD, AU	
84	*3-687-559-01	CASE (BOTTOM LID), SHIELD, AU	
85	*3-687-541-02	CASE, SHIELD	
86	*3-687-594-01	PLATE, JACK	

5-3. FRONT LOADING ASSEMBLY


BVTP3 x 8
BVTP 2.6 x 6
103
102
104
105
106
113
110
108
107
103
109
111
112
P2.6 x 10
117
118
119
114
121
118
120
116
115
P2.6 x 10
101

No.	Part No.	Description	Remark
101	A-6751-186-A	LOADING BLOCK ASSY, FRONT	102-121
102	*X-3684-117-1	PLATE ASSY, SIDE, BASE (LEFT)	
103	3-684-258-01	SPRING, TENSION	
104	X-3684-125-1	RETAINER (LEFT) ASSY, CASSETTE	
105	*X-3684-118-1	PLATE ASSY, SIDE, RIGHT	
106	*3-684-108-01	ARM, LID OPEN	
107	X-3684-124-1	RETAINER (RIGHT) ASSY, CASSETTE	
108	3-679-123-00	SHAFT, GEAR, WORM	
109	3-684-164-01	GEAR, WORM	
110	*3-684-195-01	PLATE, TOP	
111	3-684-168-01	DOOR	
112	X-3684-116-1	SHAFT ASSY, MIDWAY GEAR	
113	*3-684-166-01	ARM (LEFT), DRIVING	
114	X-3684-123-1	GEAR ASSY, DRIVING	
115	1-554-840-11	SWITCH, LEAF (CASSETTE ON)(S904)	
116	3-684-162-01	ARM, SWITCHING, DOOR	
117	3-684-111-01	GEAR (B), LIMITER	
118	3-684-115-01	SPRING	
119	3-684-109-01	GEAR (A), LIMITER	
120	3-684-163-01	GEAR, DRIVING ARM	
121	3-684-165-01	ARM (RIGHT), DRIVING	

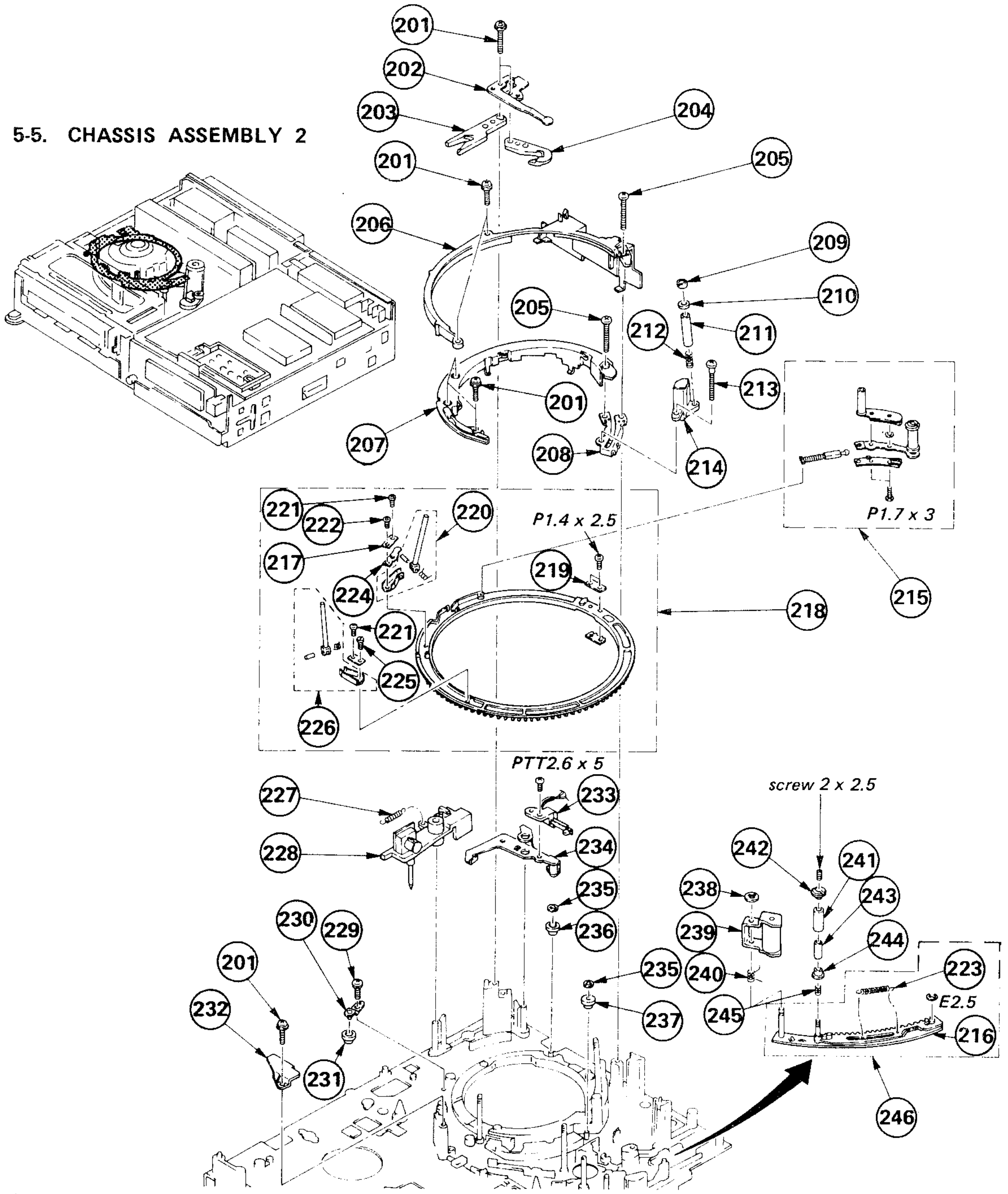
5-4. CHASSIS ASSEMBLY 1


151
152
STOP RING 2.4
153
154
155
156
157
159
161
PS2.6 x 4
PSW2.6 x 5
162
163
183
SPRING PIN
2.5 x 16
164
165
166
189
184
P2 x 8
179
168
174
180
175
169
182
176
PS2.6 x 4
170
185
172
181
178
186
187
173
171
177
188
160
189
167
158

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

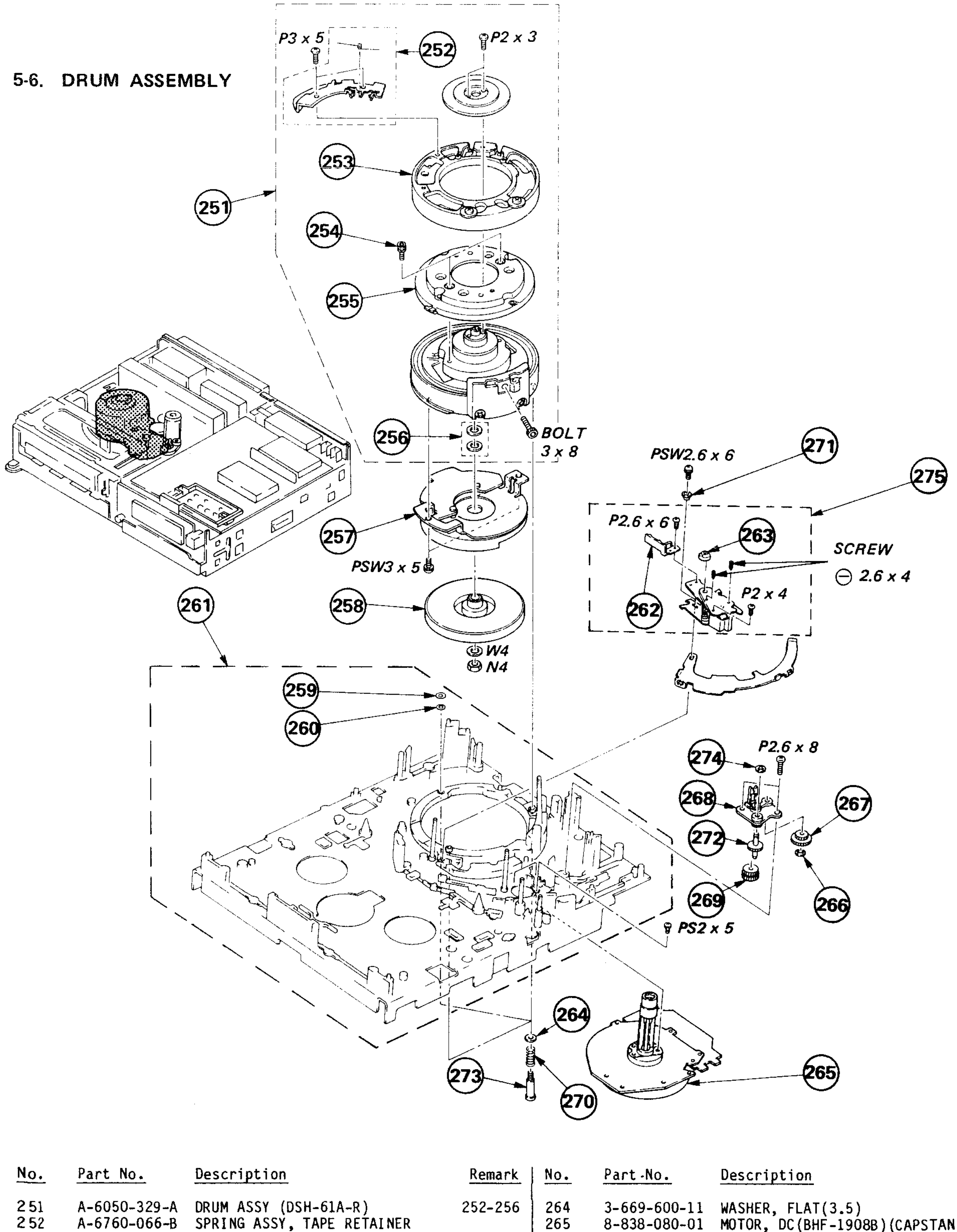
No.	Part No.	Description	Remark
151	3-684-264-01	BELT, TIMING	
152	3-684-152-01	FLANGE, INTERNAL GEAR	
153	3-683-454-01	WASHER, POLYETHYLENE	
154	3-684-178-01	GEAR, INTERNAL	
155	3-679-104-05	GEAR	
156	X-3679-111-0	CARRIER ASSY	
157	A-6740-083-B	GEAR ASSY	
158	3-701-436-11	WASHER, 1.6	
159	3-681-231-00	SCREW (+PW2.6X8), TAPPING	
160	X-3687-503-1	ARM ASSY, REVIEW BRAKE	158
161	3-679-115-00	GEAR (LARGE), LOADING	
162	3-669-480-11	+ PTPWH 2	
163	3-684-167-01	ARM, STOPPER	
164	3-684-227-01	SPRING, TENSION	
165	3-684-116-01	LIMITER, STOPPER	
166	X-3684-129-1	CHASSIS ASSY, PLANET GEAR	
167	*X-3684-114-1	LEVER ASSY, COMMUNICATION	
168	X-3669-321-0	GEAR (C) ASSY	
169	3-679-114-00	GEAR (SMALL), LOADING	
170	X-3679-268-1	MOTOR ASSY, L (LOADING/THREADING)(M904)	
171	3-669-596-00	WASHER (2.3), STOPPER	
172	*1-605-071-00	LM-8 BOARD	
173	*3-669-613-00	INSULATOR, L MOTOR	
174	3-669-318-21	NUT, ADJUSTMENT, GUIDE	
175	3-684-135-01	WASHER (UPPER), GUIDE, #7, 8	
176	3-684-133-01	SLEEVE, GUIDE, #7, 8	
177	X-3684-113-1	ARM ASSY, PINCH PRESS	
178	3-684-290-01	SPRING, COMPRESSION	
179	X-3684-109-1	ARM ASSY, PINCH SOLENOID	
180	3-669-595-00	WASHER (2), STOPPER	
181	*X-3684-112-1	ARM ASSY, PINCH LIMITER	182
182	3-515-170-00	SPRING, TENSION	
183	⚠1-454-349-41	SOLENOID, PLUNGER (PINCH)(PM901)	
184	3-669-607-00	+PSW (SMALL ROUND) 2.6	
185	1-464-329-31	SENSOR, T COIL (L902)	
186	*3-684-119-01	LINK, TAKE-UP SENSOR	
187	3-684-157-04	SPRING (T SENSOR), TENSION	
188	3-681-154-00	SPRING, TORSION	
189	3-669-465-00	WASHER (1.5), STOPPER	

5-5. CHASSIS ASSEMBLY 2


201
202
203
204
201
205
206
209
210
205
212
211
213
201
207
208
214
P1.7 x 3
215
221
222
220
P1.4 x 2.5
217
219
224
218
221
225
226
PTT2.6 x 5
227
233
228
234
screw 2 x 2.5
242
241
235
238
243
236
239
244
230
229
201
235
240
223
232
237
245
E2.5
216
231
246

No.	Part No.	Description	Remark
201	3-669-480-11	+ PTPWH 2	
202	*3-684-158-01	PLATE, GROUND, TAPE GUIDE	
203	*3-669-618-00	PLATE (2), ADJUST	
204	*3-672-507-00	PLATE (3-1), ADJUSTMENT	
205	3-669-466-21	SCREW (M 2.6)	
206	3-684-217-01	GUIDE (2), SHUTTLE	
207	*3-679-290-00	GUIDE (1-YA), SHUTTLE	
208	*X-3679-263-1	BASE ASSY, SLANT	
209	3-669-446-00	NUT, GUIDE, NO. 6	
210	3-679-910-00	FLANGE (S), GUIDE, NUMBER 6	
211	3-669-445-00	SPACER, GUIDE, NO. 6	
212	3-669-615-00	SPRING, COMPRESSION	
213	3-669-606-00	SCREW (2.6)	
214	8-825-508-10	HEAD, FE (FULL ERASE HEAD)	
215	A-6750-158-B	SHUTTLE (2) BLOCK ASSY	
216	*X-3679-265-1	SLIDER ASSY (2), T	
217	*3-669-472-02	RETAINER, SPRING, LEAF	
218	X-3679-150-0	RING (YA) ASSY, S LOADING	217, 219-222 224-226
219	*3-669-616-00	RETAINER	
220	*X-3669-430-0	HOLDER BLOCK ASSY, #3 GUIDE	
221	3-669-478-00	SCREW (1X3), TAPPING	
222	3-669-479-11	SCREW (1.4X3.5), TAPPING	
223	3-549-014-00	SPRING, TENSION	
224	3-672-583-00	SPRING	
225	3-672-586-00	SCREW (1.4X3), TAPPING	
226	*X-3669-429-0	HOLDER BLOCK ASSY, #2 GUIDE	
227	3-684-161-01	SPRING (S SENSOR), TENSION	
228	1-464-330-11	SENSOR, S COIL (L901)	
229	3-669-607-31	+PSW (SMALL ROUND) (2.6)	
230	*X-3669-329-0	PLATE ASSY, ADJUSTMENT	
231	3-669-360-00	ROLLER, RING	
232	3-669-476-04	PLATE, GUIDE	
233	1-554-840-11	SWITCH, LEAF (THREADING END) (S903)	
234	*X-3684-130-1	ARM ASSY, LOCK	
235	3-669-465-00	WASHER (1.5), STOPPER	
236	3-669-630-00	ROLLER (C), RING	
237	3-669-597-00	ROLLER (B), RING	
238	3-669-596-00	WASHER (2.3), STOPPER	
239	X-3679-264-1	ARM ASSY, PINCH ROLLER	
240	3-683-441-01	SPRING	
241	3-676-649-11	ROLLER (#9), GUIDE	
242	3-676-650-00	FLANGE (UPPER) (#9), GUIDE	
243	3-672-559-00	SLEEVE, GUIDE	
244	3-672-558-00	FLANGE (LOWER) (#9), GUIDE	
245	3-669-452-00	SPRING, COMPRESSION	
246	A-6750-165-A	GEAR ASSY, SLIDER	216, 223

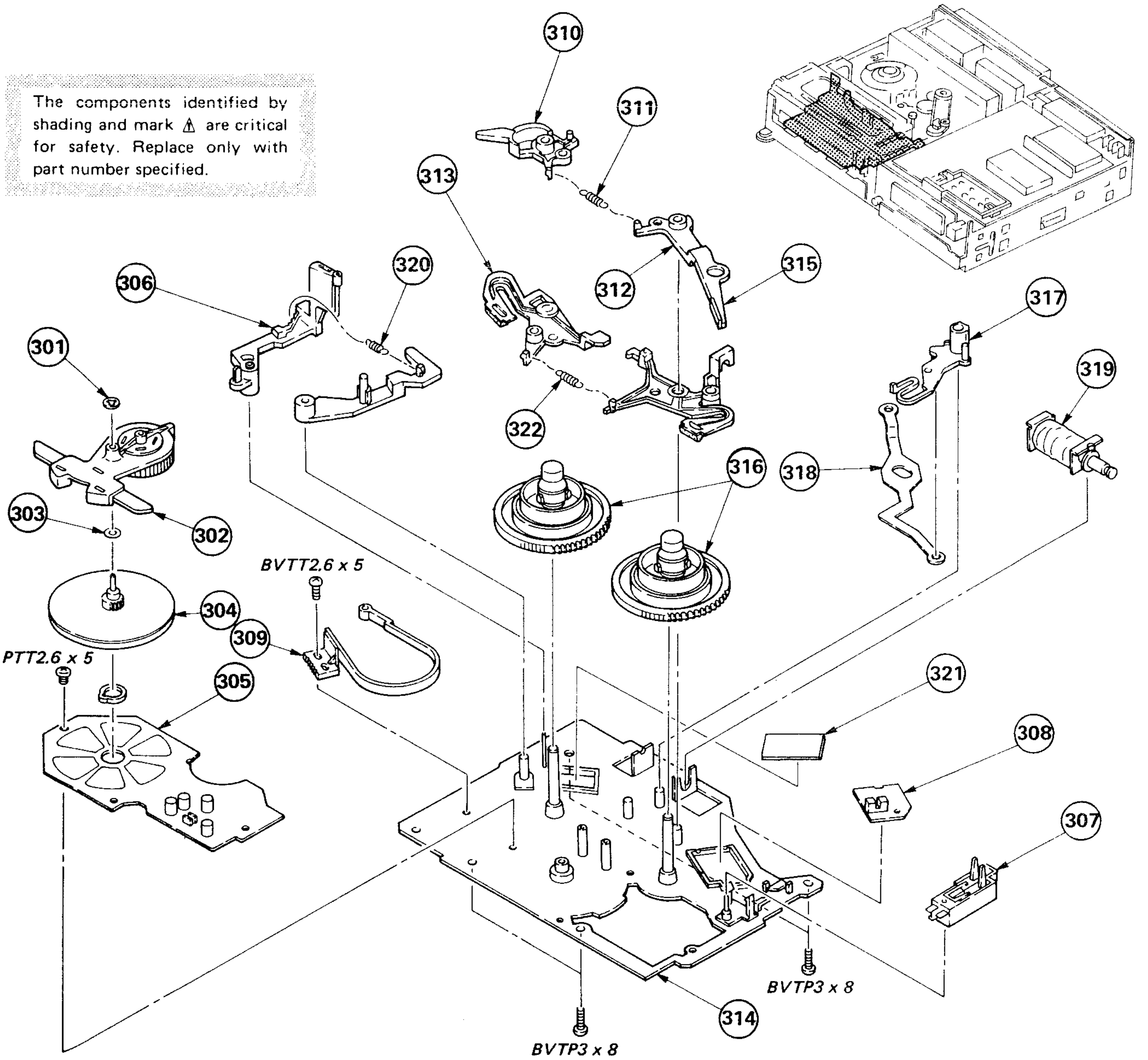
5-6. DRUM ASSEMBLY


P3 x 5
252
P2 x 3
253
251
254
255
256
BOLT
3 x 8
PSW2.6 x 6
271
275
P2.6 x 6
263
SCREW
⊖ 2.6 x 4
262
P2 x 4
257
PSW3 x 5
258
261
W4
N4
259
260
274
P2.6 x 8
268
267
272
269
266
PS2 x 5
264
273
270
265

No.	Part No.	Description	Remark
251	A-6050-329-A	DRUM ASSY (DSH-61A-R)	252-256
252	A-6760-066-B	SPRING ASSY, TAPE RETAINER	
253	A-6760-138-A	DRUM ASSY, UPPER	
254	3-669-157-00	BOLT (WASHER)(2.6X8)	
255	A-6762-215-A	DISK ASSY	
256	X-3669-105-0	SPACE BLOCK ASSY	
257	X-2621-204-2	STATOR ASSY, D	
258	X-2621-202-0	ROTOR ASSY, D	
259	3-669-646-00	SPACER, DRUM	
260	3-669-646-11	SPACER, DRUM	
261	*X-3687-505-1	CHASSIS ASSY, MECHANICAL	259, 260
262	3-684-140-01	PROTECTOR	
263	*3-684-246-02	NUT, ADJUSTMENT, HEIGHT, ACE	
264	3-669-600-11	WASHER, FLAT(3.5)	
265	8-838-080-01	MOTOR, DC(BHF-1908B)(CAPSTAN MOTOR)(M902)	
266	3-669-465-00	WASHER (1.5), STOPPER	
267	3-669-337-00	GEAR (D)	
268	X-3679-147-0	CHASSIS (B) ASSY, DRIVE GEAR	
269	3-669-338-00	GEAR (E)	
270	3-429-123-00	SPRING	
271	3-684-247-01	BUSHING, ACE	
272	X-3684-166-1	GEAR(F) ASSY(C)	
273	3-669-302-00	SCREW, FITTING	
274	3-669-595-00	WASHER (2), STOPPER	
275	A-6761-075-A	ACE ASSY	262, 263

5-7. REEL BLOCK ASSEMBLY

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.


310
311
313
320
306
312
315
317
301
319
322
316
318
303
302
BVTT2.6 x 5
304
309
PTT2.6 x 5
305
321
308
307
BVTP3 x 8
314
BVTP3 x 8

No.	Part No.	Description	Remark
301	3-669-595-00	WASHER (2), STOPPER	
302	A-6759-074-A	ARM BLOCK ASSY, PENDULUM	
303	3-679-318-00	WASHER, PENDULUM ARM	
304	X-2622-201-0	ROTOR ASSY, R	
305	*A-4910-049-A	R STATOR BOARD,COMPLETE(REEL MOTOR)(M903)	
306	X-3684-121-1	LEVER ASSY, TENSION REGULATOR	
307	1-554-839-11	SWITCH, LEAF (2 GANG)(S901) (REC PROOF/CASSETTE DOWN)	
308	*1-613-233-12	RD-21 BOARD	
309	X-3679-120-0	BAND ASSY, TENSION REGULATOR	
310	3-684-192-01	ARM, BRAKE, SUPPLY SOFT	
311	3-684-235-01	SPRING, TENSION	
312	X-3684-137-1	BRAKE ASSY, T SOFT	
313	X-3684-107-1	BRAKE ASSY, SUPPLY	
314	*X-3684-131-1	CHASSIS ASSY, SUB	
315	X-3684-108-1	BRAKE ASSY, TAKE-UP	
316	X-3684-106-1	TABLE ASSY, REEL	
317	3-684-193-01	ARM, PENDULUM STOPPER	
318	*3-684-183-01	LINK, L	
319	⚠1-454-371-31	SOLENOID, PLUNGER (BRAKE)(PM902)	
320	3-679-151-00	SPRING, TENSION	
321	*1-613-232-12	RD-20 BOARD	
322	3-685-772-01	SPRING, TENSION	

5-8. HARDWARE LIST

SCREW

7-621-770-67	SCREW +P 2.6X6
7-621-759-35	+PSW, 2.6X5
7-621-759-85	+PSW, 2.6X12
7-621-759-95	+PSW, 2.6X14
7-627-551-28	SCREW, PRECISION +P 1.4X2.5
7-627-552-38	SCREW, PRECISION +P 1.7X3
7-627-553-18	SCREW, PRECISION +P 2X2
7-627-553-47	SCREW, PRECISION +P 2X4
7-628-253-15	SCREW +PS 2X5
7-628-253-95	SCREW +PS 2.6X4
7-628-254-15	SCREW +PS 2.6X6
7-682-548-04	SCREW +P 3X8
7-685-134-14	SCREW +P 2.6X8 TYPE2 NON-SLIT
7-685-135-14	SCREW +P 2.6X10 TYPE2 NON-SLIT
7-685-645-71	SCREW +BVTP 3X6 TYPE2 IT-3
7-685-645-81	SCREW +BVTP 3X6 TYPE2
7-685-646-71	SCREW +BVTP 3X8 TYPE2 IT-3
7-685-646-81	SCREW +BVTP 3X8 TYPE2
7-685-646-89	SCREW +BVTP 3X8 TYPE2
7-685-790-04	SCREW +PTT 2.6X4 (S)
7-685-791-04	SCREW +PTT 2.6X5 (S)
7-685-791-04	SCREW +BVTT 2.6X5 (S)

SET-SCREW

7-621-710-25	SET-SCREW, SLOT 2X3 CONE POINT
7-621-731-08	SET-SCT, HEX. 2X2.5, FLAT POINT
7-621-732-08	SET-SCT, HEX. 2X3 FLAT POINT
7-683-174-21	SET-SCREW, SLOT 3X4 CONE POINT

RING

7-624-118-01	RING, RETAINING E-2.5
7-624-190-61	STOP RING 2.4, TYPE-CS

TAPPING

7-685-105-14	TPG +P 2X8, TYPE 2, NON-SLIT

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.

- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS

- All resistors are in ohms
- F : nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS

- MF : μF, PF : μμF

COILS

- MMH : mH, UH : μH

No.	Part No.	Description			Remark
	*A-4910-049-A	R STATOR (REEL MOTOR) BOARD, COMPLETE *************************************			
	*1-560-460-00	PIN, CONNECTOR 4P			
		CAPACITOR			
C1	1-123-821-00	ELECT	47MF	20%	16V
C2	1-123-821-00	ELECT	47MF	20%	16V
C3	1-123-821-00	ELECT	47MF	20%	16V
C4	1-123-821-00	ELECT	47MF	20%	16V
		DIODE			
D1	8-719-941-48	DIODE 1N4148TP			
		IC			
IC1	8-759-108-77	IC CX-877			
		TRANSISTOR			
Q1	8-729-100-01	TRANSISTOR 2SD992-N			
Q2	8-729-100-01	TRANSISTOR 2SD992-N			
Q3	8-729-100-01	TRANSISTOR 2SD992-N			
Q4	8-729-100-01	TRANSISTOR 2SD992-N			
Q5	8-729-100-01	TRANSISTOR 2SD992-N			
Q6	8-729-100-01	TRANSISTOR 2SD992-N			
		RESISTOR			
R1	1-247-823-00	CARBON	470	5%	1/6W
R2	1-247-823-00	CARBON	470	5%	1/6W
R3	1-247-823-00	CARBON	470	5%	1/6W
R4	1-247-829-00	CARBON	820	5%	1/6W
R5	1-247-871-00	CARBON	47K	5%	1/6W
R6	1-247-871-00	CARBON	47K	5%	1/6W
R7	1-247-871-00	CARBON	47K	5%	1/6W
R8	1-247-871-00	CARBON	47K	5%	1/6W
		DIODE			
S1	8-719-810-31	DIODE THS103-1			
S2	8-719-810-31	DIODE THS103-1			

****

No.	Part No.	Description			Remark
	*A-6707-468-A	TM BOARD, COMPLETE ******************			
		CAPACITOR			
C001	1-123-382-00	ELECT	3.3MF	20%	50V
C003	1-123-298-00	ELECT	470MF	20%	6.3V
C004	1-161-773-00	CERAMIC	0.1MF	20%	25V
C005	1-102-525-00	CERAMIC	68PF	5%	50V
C006	1-102-852-00	CERAMIC	47PF	5%	50V
C008	1-123-357-00	ELECT	22MF	20%	50V
C009	1-161-055-00	CERAMIC	0.022MF	10%	50V
C010	1-161-055-00	CERAMIC	0.022MF	10%	50V
C011	1-161-773-00	CERAMIC	0.1MF	20%	25V
C012	1-123-308-00	ELECT	220MF	20%	10V
C013	1-123-611-00	ELECT	1MF	20%	50V
		DIODE			
D001	8-719-812-41	DIODE TLR124			
D002	8-719-911-19	DIODE 1SS119			
D003	8-719-911-19	DIODE 1SS119			
D005	8-719-162-07	DIODE RD6.2E-B			
D006	8-719-911-19	DIODE 1SS119			
D007	8-719-911-19	DIODE 1SS119			
		FLUORESCENT INDICATOR			
FL001	1-519-322-11	INDICATOR, FLUORESCENT			
		IC			
IC001	8-759-911-09	IC MB88525B-112M			
IC002	8-759-913-41	IC S-8054ALB			
		COIL			
L001	1-408-623-00	MICRO INDUCTOR 470UH			
L002	1-408-623-00	MICRO INDUCTOR 470UH			
		TRANSISTOR			
Q001	8-729-245-83	TRANSISTOR 2SC2458			
Q002	8-729-245-83	TRANSISTOR 2SC2458			
Q003	8-729-204-83	TRANSISTOR 2SA1048-GR			
Q004	8-729-900-89	TRANSISTOR DTC144ES			
Q005	8-729-245-83	TRANSISTOR 2SC2458			
		RESISTOR			
R001	1-247-867-00	CARBON	33K	5%	1/6W
R002	1-247-874-00	CARBON	62K	5%	1/6W
R003	1-247-872-00	CARBON	51K	5%	1/6W
R004	1-247-873-00	CARBON	56K	5%	1/6W
R005	1-247-869-00	CARBON	39K	5%	1/6W
R006	1-247-885-00	CARBON	180K	5%	1/6W
R007	1-247-879-00	CARBON	100K	5%	1/6W
R008	1-247-867-00	CARBON	33K	5%	1/6W
R010	1-247-179-00	CARBON	100K	5%	1/4W
R011	1-247-855-00	CARBON	10K	5%	1/6W
R012	1-247-855-00	CARBON	10K	5%	1/6W
R013	1-247-855-00	CARBON	10K	5%	1/6W
R014	1-247-855-00	CARBON	10K	5%	1/6W
R024	1-247-867-00	CARBON	33K	5%	1/6W
R025	1-247-833-00	CARBON	1.2K	5%	1/6W
R026	1-247-883-00	CARBON	150K	5%	1/6W
R027	1-247-883-00	CARBON	150K	5%	1/6W
R028	1-247-883-00	CARBON	150K	5%	1/6W
R029	1-247-883-00	CARBON	150K	5%	1/6W
R030	1-247-883-00	CARBON	150K	5%	1/6W
R031	1-247-883-00	CARBON	150K	5%	1/6W

No.	Part No.	Description	Remark
R032	1-247-883-00	CARBON 150K 5% 1/6W	
R033	1-247-883-00	CARBON 150K 5% 1/6W	
R034	1-247-883-00	CARBON 150K 5% 1/6W	
R035	1-247-883-00	CARBON 150K 5% 1/6W	
R036	1-247-883-00	CARBON 150K 5% 1/6W	
R037	1-247-883-00	CARBON 150K 5% 1/6W	
R038	1-247-883-00	CARBON 150K 5% 1/6W	
R039	1-247-883-00	CARBON 150K 5% 1/6W	
R040	1-247-883-00	CARBON 150K 5% 1/6W	
R041	1-247-883-00	CARBON 150K 5% 1/6W	
R042	1-247-883-00	CARBON 150K 5% 1/6W	
R043	1-247-883-00	CARBON 150K 5% 1/6W	
R044	1-247-883-00	CARBON 150K 5% 1/6W	
R046	1-247-879-00	CARBON 100K 5% 1/6W	
R047	1-247-147-00	CARBON 4.7K 5% 1/4W	
R048	1-247-863-00	CARBON 22K 5% 1/6W	
R049	1-247-107-00	CARBON 100 5% 1/4W	
		VARIABLE RESISTOR	
RV001	1-228-749-00	RES, ADJ, CARBON 22K	
		SWITCH	
S002	1-554-174-00	SWITCH, KEY BOARD	
S004	1-554-174-00	SWITCH, KEY BOARD	
S012	1-554-174-00	SWITCH, KEY BOARD	
		TRIMMER	
TC001	1-141-022-21	CAP, TRIMMER, CERAMIC	
		CRYSTAL	
X001	1-567-098-00	VIBRATOR, CRYSTAL	
************	************	************	************
	*1-613-230-12	TM-58 BOARD ************	
		SWITCH	
S003	1-554-174-00	SWITCH, KEY BOARD	
S005	1-554-174-00	SWITCH, KEY BOARD	
S006	1-554-174-00	SWITCH, KEY BOARD	
S007	1-554-174-00	SWITCH, KEY BOARD	
S008	1-554-174-00	SWITCH, KEY BOARD	
S009	1-554-174-00	SWITCH, KEY BOARD	
S010	1-554-174-00	SWITCH, KEY BOARD	
S011	1-554-174-00	SWITCH, KEY BOARD	
S013	1-554-837-11	SWITCH, SLIDE	
************	************	************	************
	*A-6711-565-A	RP-20 BOARD, COMPLETE **********************	
	*3-687-522-01	LID, BOTTOM, SHIELD CASE, RP	

No.	Part No.	Description	Remark
	*3-687-533-01	CASE (MAIN), SHIELD, RP	
		CAPACITOR	
C503	1-161-059-00	CERAMIC 0.047MF 20% 25V	
C504	1-161-059-00	CERAMIC 0.047MF 20% 25V	
C505	1-161-059-00	CERAMIC 0.047MF 20% 25V	
C506	1-123-318-00	ELECT 33MF 20% 10V	
C510	1-161-059-00	CERAMIC 0.047MF 20% 25V	
C511	1-161-059-00	CERAMIC 0.047MF 20% 25V	
C512	1-102-953-00	CERAMIC 18PF 5% 50V	
C513	1-102-953-00	CERAMIC 18PF 5% 50V	
C514	1-123-381-00	ELECT 2.2MF 20% 50V	
C515	1-161-047-00	CERAMIC 0.0047MF 10% 25V	
C516	1-161-055-00	CERAMIC 0.022MF 10% 25V	
C517	1-123-356-00	ELECT 10MF 20% 16V	
C518	1-102-953-00	CERAMIC 18PF 5% 50V	
C519	1-161-013-00	CERAMIC 0.01MF 20% 25V	
C520	1-161-013-00	CERAMIC 0.01MF 20% 25V	
C521	1-123-356-00	ELECT 10MF 20% 16V	
C522	1-102-114-00	CERAMIC 470PF 10% 50V	
C523	1-161-055-00	CERAMIC 0.022MF 10% 25V	
C524	1-161-055-00	CERAMIC 0.022MF 10% 25V	
C525	1-102-953-00	CERAMIC 18PF 5% 50V	
C526	1-161-057-00	CERAMIC 0.033MF 10% 25V	
C527	1-161-773-00	CERAMIC 0.1MF 20% 25V	
C529	1-123-380-00	ELECT 1MF 20% 50V	
C532	1-123-380-00	ELECT 1MF 20% 50V	
C536	1-102-942-00	CERAMIC 5PF 0.5PF 50V	
C539	1-161-013-00	CERAMIC 0.01MF 20% 25V	
C542	1-161-013-00	CERAMIC 0.01MF 20% 25V	
C543	1-123-332-00	ELECT 47MF 20% 16V	
C544	1-123-332-00	ELECT 47MF 20% 16V	
C545	1-161-013-00	CERAMIC 0.01MF 20% 25V	
C546	1-131-361-00	TANTALUM 2.2MF 20% 16V	
C550	1-161-013-00	CERAMIC 0.01MF 20% 25V	
C553	1-161-059-00	CERAMIC 0.047MF 20% 25V	
C554	1-102-128-00	CERAMIC 0.0082MF 10% 50V	
		CONNECTOR	
CN501	*1-508-848-00	PIN, CONNECTOR 6P	
CN502	*1-564-031-00	PIN, CONNECTOR 6P	
CN503	*1-508-846-00	PIN, CONNECTOR 8P	
CN504	*1-508-845-00	PIN, CONNECTOR 6P	
		IC	
IC501	8-758-620-00	IC CX-862	
IC503	8-751-340-00	IC CX-134A	
		COIL	
L502	1-408-030-00	MICRO INDUCTOR 0.68UH	
L504	1-408-030-00	MICRO INDUCTOR 0.68UH	
L505	1-408-158-00	MICRO INDUCTOR 6.8MMH	
L506	1-408-414-00	MICRO INDUCTOR 27UH	

When indicating parts by reference number, please include the board name.

No.	Part No.	Description	Remark
L507	1-408-158-00	MICRO INDUCTOR 6.8MMH	
L508	1-408-414-00	MICRO INDUCTOR 27UH	
L509	1-408-417-00	MICRO INDUCTOR 47UH	
L512	1-408-454-00	MICRO INDUCTOR 100UH	
L513	1-407-717-00	MICRO INDUCTOR 1MMH	
L516	1-408-422-00	MICRO INDUCTOR 120UH	
L517	1-407-495-00	MICRO INDUCTOR 1.8MMH	

TRANSISTOR

No.	Part No.	Description	Remark
Q501	8-729-900-36	TRANSISTOR DTC124ES	
Q502	8-729-117-54	TRANSISTOR 2SA1175-E	
Q503	8-729-177-32	TRANSISTOR 2SD773-3	
Q508	8-729-245-83	TRANSISTOR 2SC2458-BL	

RESISTOR

No.	Part No.	Description				Remark
R503	1-247-844-00	CARBON	3.6K	5%	1/6W	
R504	1-247-852-00	CARBON	7.5K	5%	1/6W	
R505	1-247-855-00	CARBON	10K	5%	1/6W	
R506	1-247-831-00	CARBON	1K	5%	1/6W	
R507	1-247-867-00	CARBON	33K	5%	1/6W	
R515	1-247-831-00	CARBON	1K	5%	1/6W	
R517	1-247-824-00	CARBON	510	5%	1/6W	
R518	1-247-824-00	CARBON	510	5%	1/6W	
R519	1-247-779-00	CARBON	6.8	5%	1/6W	
R520	1-247-822-00	CARBON	430	5%	1/6W	
R521	1-247-855-00	CARBON	10K	5%	1/6W	
R522 ⚠	1-212-855-00	FUSIBLE	8.2	5%	1/4W	F
R523	1-247-839-00	CARBON	2.2K	5%	1/6W	
R524	1-247-839-00	CARBON	2.2K	5%	1/6W	
R525	1-247-839-00	CARBON	2.2K	5%	1/6W	
R526	1-247-839-00	CARBON	2.2K	5%	1/6W	
R527	1-247-831-00	CARBON	1K	5%	1/6W	
R528	1-247-831-00	CARBON	1K	5%	1/6W	
R529	1-247-825-00	CARBON	560	5%	1/6W	
R530	1-247-835-00	CARBON	1.5K	5%	1/6W	
R531 ⚠	1-212-855-00	FUSIBLE	8.2	5%	1/4W	F
R533	1-247-847-00	CARBON	4.7K	5%	1/6W	
R534	1-247-839-00	CARBON	2.2K	5%	1/6W	
R535	1-247-849-00	CARBON	5.6K	5%	1/6W	
R536	1-247-849-00	CARBON	5.6K	5%	1/6W	
R537	1-247-809-00	CARBON	120	5%	1/6W	
R540	1-247-819-00	CARBON	330	5%	1/6W	
R543	1-247-819-00	CARBON	330	5%	1/6W	
R545	1-247-844-00	CARBON	3.6K	5%	1/6W	
R546	1-247-844-00	CARBON	3.6K	5%	1/6W	
R547	1-247-828-00	CARBON	750	5%	1/6W	
R548	1-247-807-00	CARBON	100	5%	1/6W	
R549	1-247-831-00	CARBON	1K	5%	1/6W	
R550	1-247-831-00	CARBON	1K	5%	1/6W	
R551	1-247-835-00	CARBON	1.5K	5%	1/6W	
R552	1-247-835-00	CARBON	1.5K	5%	1/6W	
R557	1-247-815-00	CARBON	220	5%	1/6W	
R559	1-247-855-00	CARBON	10K	5%	1/6W	

VARIABLE RESISTOR

No.	Part No.	Description	Remark
RV501	1-228-920-00	RES, ADJ, CARBON 2.2K	
RV502	1-228-920-00	RES, ADJ, CARBON 2.2K	
RV503	1-228-920-00	RES, ADJ, CARBON 2.2K	

****

*A-6711-566-A YC-31 BOARD, COMPLETE
****

*1-536-870-11 TERMINAL BOARD, CONTROL PANEL

BAND PASS FILTER

No.	Part No.	Description	Remark
BPF001	1-235-098-00	FILTER, BAND PASS	

CAPACITOR

No.	Part No.	Description				Remark
C002	1-123-356-00	ELECT	10MF	20%	16V	
C010	1-123-356-00	ELECT	10MF	20%	16V	
C011	1-123-356-00	ELECT	10MF	20%	25V	
C013	1-123-306-00	ELECT	47MF	20%	10V	
C014	1-123-361-00	ELECT	2.2MF	20%	50V	
C015	1-123-306-00	ELECT	47MF	20%	10V	
C016	1-108-509-00	MYLAR	0.027MF	5%	50V	
C017	1-101-004-00	CERAMIC	0.01MF		50V	
C018	1-123-306-00	ELECT	47MF	20%	10V	
C019	1-101-004-00	CERAMIC	0.01MF		50V	
C020	1-101-004-00	CERAMIC	0.01MF		50V	
C021	1-101-004-00	CERAMIC	0.01MF		50V	
C023	1-101-882-00	CERAMIC	51PF	5%	50V	
C024	1-130-047-00	FILM	180PF	5%	50V	
C025	1-106-172-00	MYLAR	0.001MF	5%	50V	
C026	1-101-059-00	CERAMIC	510PF	5%	50V	
C027	1-161-045-00	CERAMIC	0.0033MF	10%	25V	
C028	1-106-172-00	MYLAR	0.001MF	5%	50V	
C029	1-123-382-00	ELECT	3.3MF	20%	50V	
C031	1-101-004-00	CERAMIC	0.01MF		50V	
C032	1-102-816-00	CERAMIC	120PF	5%	50V	
C033	1-101-004-00	CERAMIC	0.01MF		50V	
C034	1-101-004-00	CERAMIC	0.01MF		50V	
C035	1-102-816-00	CERAMIC	120PF	5%	50V	
C036	1-101-882-00	CERAMIC	51PF	5%	50V	
C037	1-101-004-00	CERAMIC	0.01MF		50V	
C038	1-101-004-00	CERAMIC	0.01MF		50V	
C039	1-101-004-00	CERAMIC	0.01MF		50V	
C040	1-101-004-00	CERAMIC	0.01MF		50V	
C041	1-161-005-00	CERAMIC	0.0022MF	10%	25V	
C042	1-102-516-00	CERAMIC	27PF	5%	50V	
C043	1-101-004-00	CERAMIC	0.01MF		50V	
C044	1-101-004-00	CERAMIC	0.01MF		50V	
C045	1-102-523-00	CERAMIC	56PF	5%	50V	
C046	1-101-004-00	CERAMIC	0.01MF		50V	
C047	1-101-004-00	CERAMIC	0.01MF		50V	
C048	1-101-004-00	CERAMIC	0.01MF		50V	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

No.	Part No.	Description			Remark
C049	1-101-004-00	CERAMIC	0.01MF		50V
C050	1-102-865-00	CERAMIC	8PF	0.5PF	50V
C051	1-102-525-00	CERAMIC	68PF	5%	50V
C052	1-102-525-00	CERAMIC	68PF	5%	50V
C053	1-123-380-00	ELECT	1MF	20%	50V
C054	1-161-040-00	CERAMIC	0.0012MF	10%	25V
C055	1-123-380-00	ELECT	1MF	20%	50V
C056	1-102-962-00	CERAMIC	30PF	5%	50V
C057	1-102-981-00	CERAMIC	300PF	5%	50V
C058	1-123-306-00	ELECT	47MF	20%	10V
C059	1-101-004-00	CERAMIC	0.01MF		50V
C060	1-108-579-00	MYLAR	0.01MF	5%	50V
C061	1-123-382-00	ELECT	3.3MF	20%	50V
C062	1-123-306-00	ELECT	47MF	20%	10V
C063	1-101-004-00	CERAMIC	0.01MF		50V
C064	1-102-521-00	CERAMIC	43PF	5%	50V
C065	1-102-527-00	CERAMIC	82PF	5%	50V
C066	1-102-518-00	CERAMIC	33PF	5%	50V
C067	1-161-025-00	CERAMIC	0.1MF	10%	25V
C068	1-101-004-00	CERAMIC	0.01MF		50V
C069	1-102-962-00	CERAMIC	30PF	5%	50V
C070	1-101-004-00	CERAMIC	0.01MF		50V
C071	1-123-380-00	ELECT	1MF	20%	50V
C072	1-101-004-00	CERAMIC	0.01MF		50V
C073	1-102-525-00	CERAMIC	68PF	5%	50V
C074	1-102-525-00	CERAMIC	68PF	5%	50V
C075	1-101-004-00	CERAMIC	0.01MF		50V
C076	1-102-951-00	CERAMIC	15PF	5%	50V
C077	1-123-330-00	ELECT	22MF	20%	16V
C078	1-123-330-00	ELECT	22MF	20%	16V
C080	1-101-004-00	CERAMIC	0.01MF		50V
C082	1-161-024-00	CERAMIC	0.082MF	10%	25V
C083	1-102-977-00	CERAMIC	200PF	5%	50V
C084	1-123-369-00	ELECT	4.7MF	20%	25V
C085	1-101-004-00	CERAMIC	0.01MF		50V
C086	1-108-557-00	MYLAR	0.0012MF	5%	50V
C087	1-161-057-00	CERAMIC	0.033MF	10%	25V
C088	1-101-361-00	CERAMIC	150PF	5%	50V
C092	1-101-004-00	CERAMIC	0.01MF		50V
C093	1-101-006-00	CERAMIC	0.047MF		50V
C095	1-102-976-00	CERAMIC	180PF	5%	50V
C096	1-102-824-00	CERAMIC	470PF	5%	50V
C097	1-102-823-00	CERAMIC	430PF	5%	50V
C098	1-102-820-00	CERAMIC	330PF	5%	50V
C099	1-102-851-00	CERAMIC	15PF	5%	50V
C100	1-161-025-00	CERAMIC	0.1MF	10%	25V
C101	1-108-595-00	MYLAR	0.047MF	5%	50V
C102	1-161-043-00	CERAMIC	0.0022MF	10%	25V
C103	1-106-172-00	MYLAR	0.001MF	5%	50V
C104	1-102-977-00	CERAMIC	200PF	5%	50V
C105	1-102-973-00	CERAMIC	100PF	5%	50V
C106	1-123-356-00	ELECT	10MF	20%	16V
C107	1-161-025-00	CERAMIC	0.1MF	10%	25V
C108	1-101-004-00	CERAMIC	0.01MF		50V
C109	1-101-004-00	CERAMIC	0.01MF		50V
C111	1-101-882-00	CERAMIC	51PF	5%	50V
C112	1-101-004-00	CERAMIC	0.01MF		50V
C113	1-101-006-00	CERAMIC	0.047MF		50V
C114	1-101-880-00	CERAMIC	47PF	5%	50V
C116	1-101-004-00	CERAMIC	0.01MF		50V
C117	1-101-361-00	CERAMIC	150PF	5%	50V
C118	1-101-004-00	CERAMIC	0.01MF		50V
C119	1-123-306-00	ELECT	47MF	20%	10V
C120	1-101-004-00	CERAMIC	0.01MF		50V
C121	1-101-004-00	CERAMIC	0.01MF		50V
C122	1-101-004-00	CERAMIC	0.01MF		50V
C123	1-101-004-00	CERAMIC	0.01MF		50V
C124	1-102-518-00	CERAMIC	33PF	5%	50V
C125	1-123-330-00	ELECT	22MF	20%	16V
C127	1-123-318-00	ELECT	33MF	20%	16V
C128	1-123-330-00	ELECT	22MF	20%	16V
C129	1-123-330-00	ELECT	22MF	20%	16V
C130	1-123-356-00	ELECT	10MF	20%	16V
C131	1-123-380-00	ELECT	1MF	20%	50V
C132	1-123-369-00	ELECT	4.7MF	20%	25V
C133	1-102-851-00	CERAMIC	15PF	5%	50V
C134	1-102-821-00	CERAMIC	360PF	5%	50V
C135	1-102-823-00	CERAMIC	430PF	5%	50V
C136	1-102-976-00	CERAMIC	180PF	5%	50V
C137	1-102-513-00	CERAMIC	18PF	5%	50V
C138	1-102-529-00	CERAMIC	100PF	5%	50V
C139	1-102-530-00	CERAMIC	120PF	5%	50V
C140	1-102-519-00	CERAMIC	36PF	5%	50V
C141	1-102-529-00	CERAMIC	100PF	5%	50V
C142	1-123-369-00	ELECT	4.7MF	20%	25V
C144	1-102-511-00	CERAMIC	13PF	5%	50V
C145	1-102-522-00	CERAMIC	51PF	5%	50V
C146	1-102-522-00	CERAMIC	51PF	5%	50V
C147	1-102-511-00	CERAMIC	13PF	5%	50V
C148	1-101-006-00	CERAMIC	0.047MF		50V
C155	1-101-004-00	CERAMIC	0.01MF		50V
C156	1-101-004-00	CERAMIC	0.01MF		50V
C157	1-102-981-00	CERAMIC	300PF	5%	50V
C158	1-102-948-00	CERAMIC	11PF	5%	50V
C159	1-102-822-00	CERAMIC	390PF	5%	50V
C178	1-123-330-00	ELECT	22MF	20%	16V
C179	1-123-356-00	ELECT	10MF	20%	16V
C180	1-123-332-00	ELECT	47MF	20%	16V
C181	1-106-186-00	MYLAR	0.0039MF	5%	50V
C182	1-123-380-00	ELECT	1MF	20%	50V
C183	1-101-006-00	CERAMIC	0.047MF		50V
C184	1-123-332-00	ELECT	47MF	20%	16V
C185	1-123-333-00	ELECT	100MF	20%	16V
C186	1-101-004-00	CERAMIC	0.01MF		50V
C187	1-123-330-00	ELECT	22MF	20%	16V
C188	1-161-025-00	CERAMIC	0.1MF	10%	25V

When indicating parts by reference number, please include the board name.

YC-31

No.	Part No.	Description			Remark
C189	1-123-356-00	ELECT	10MF	20%	16V
C190	1-123-311-00	ELECT	1000MF	20%	10V
C191	1-101-004-00	CERAMIC	0.01MF		50V
C192	1-123-369-00	ELECT	4.7MF	20%	25V
C196	1-123-380-00	ELECT	1MF	20%	50V
C197	1-123-356-00	ELECT	10MF	20%	16V
C198	1-102-973-00	CERAMIC	100PF	5%	50V
C200	1-101-004-00	CERAMIC	0.01MF		50V
C201	1-123-356-00	ELECT	10MF	20%	16V
C203	1-101-004-00	CERAMIC	0.01MF		50V
C204	1-123-369-00	ELECT	4.7MF	20%	25V
C206	1-101-004-00	CERAMIC	0.01MF		50V
C207	1-161-025-00	CERAMIC	0.1MF	10%	25V
C208	1-123-356-00	ELECT	10MF	20%	16V
C211	1-123-356-00	ELECT	10MF	20%	16V
C212	1-123-333-00	ELECT	100MF	20%	16V
C217	1-161-025-00	CERAMIC	0.1MF	10%	25V
C219	1-123-356-00	ELECT	10MF	20%	16V
C220	1-161-059-00	CERAMIC	0.047MF	10%	25V
C241	1-161-025-00	CERAMIC	0.1MF	10%	25V
C243	1-161-025-00	CERAMIC	0.1MF	10%	25V
C246	1-161-025-00	CERAMIC	0.1MF	10%	25V
C248	1-161-059-00	CERAMIC	0.047MF	10%	25V
C251	1-161-059-00	CERAMIC	0.047MF	10%	25V
C252	1-101-081-00	CERAMIC	130PF	5%	50V
C253	1-123-356-00	ELECT	10MF	20%	16V
C257	1-161-059-00	CERAMIC	0.047MF	10%	25V
C258	1-161-059-00	CERAMIC	0.047MF	10%	25V
C401	1-123-381-00	ELECT	2.2MF	20%	50V
C402	1-101-001-00	CERAMIC	0.001MF		50V
C403	1-101-001-00	CERAMIC	0.001MF		50V
C404	1-101-004-00	CERAMIC	0.01MF		50V
C405	1-123-330-00	ELECT	22MF	20%	16V
C406	1-123-330-00	ELECT	22MF	20%	16V
C407	1-102-962-00	CERAMIC	30PF	5%	50V
C408	1-101-888-00	CERAMIC	68PF	5%	50V
C409	1-123-381-00	ELECT	2.2MF	20%	50V
C410	1-102-936-00	CERAMIC	3PF	0.25PF	50V
C411	1-101-005-00	CERAMIC	0.022MF		50V
C412	1-123-318-00	ELECT	33MF	20%	16V
C414	1-123-318-00	ELECT	33MF	20%	16V
C415	1-123-356-00	ELECT	10MF	20%	16V
C416	1-102-948-00	CERAMIC	11PF	5%	50V
C417	1-102-948-00	CERAMIC	11PF	5%	50V
C418	1-102-965-00	CERAMIC	39PF	5%	50V
C419	1-123-356-00	ELECT	10MF	20%	16V
C420	1-123-369-00	ELECT	4.7MF	20%	25V
C421	1-101-006-00	CERAMIC	0.047MF		50V
C501	1-101-004-00	CERAMIC	0.01MF		50V
C502	1-101-004-00	CERAMIC	0.01MF		50V
C503	1-101-004-00	CERAMIC	0.01MF		50V
C504	1-101-005-00	CERAMIC	0.022MF		50V
C505	1-102-822-00	CERAMIC	390PF	5%	50V

No.	Part No.	Description			Remark
C506	1-101-006-00	CERAMIC	0.047MF		50V
C507	1-123-318-00	ELECT	33MF	20%	16V
C607	1-101-004-00	CERAMIC	0.01MF		50V
C608	1-161-059-00	CERAMIC	0.047MF	10%	25V
C609	1-101-006-00	CERAMIC	0.047MF		50V
C611	1-101-006-00	CERAMIC	0.047MF		50V
C613	1-101-004-00	CERAMIC	0.01MF		50V
C616	1-102-518-00	CERAMIC	33PF	5%	50V
C617	1-161-025-00	CERAMIC	0.1MF	10%	25V
C618	1-161-025-00	CERAMIC	0.1MF	10%	25V
C619	1-161-025-00	CERAMIC	0.1MF	10%	25V
C620	1-102-516-00	CERAMIC	27PF	5%	50V

FILTER

CF001	1-527-998-00	FILTER, CERAMIC
CF002	1-527-875-00	FILTER, CERAMIC
CF003	1-527-849-00	FILTER, CERAMIC

CONNECTOR

CN001	*1-560-894-00	PIN, CONNECTOR 6P
CN002	*1-560-896-00	PIN, CONNECTOR 8P
CN003	*1-560-891-00	PIN, CONNECTOR 3P
CN004	*1-560-894-00	PIN, CONNECTOR 6P
CN005	*1-560-893-00	PIN, CONNECTOR 5P
CN006	*1-560-893-00	PIN, CONNECTOR 5P
CN007	*1-560-892-00	PIN, CONNECTOR 4P
CN008	*1-560-895-00	PIN, CONNECTOR 7P

TRIMMER

CV001	1-141-275-00	CAP, TRIMMER

DIODE

D005	8-719-911-19	DIODE 1SS119
D006	8-719-000-06	DIODE MC921
D009	8-719-000-06	DIODE MC921
D011	8-719-911-19	DIODE 1SS119
D012	8-719-911-19	DIODE 1SS119
D013	8-719-911-19	DIODE 1SS119
D014	8-719-911-19	DIODE 1SS119
D015	8-719-911-19	DIODE 1SS119
D016	8-719-000-12	DIODE MC931
D017	8-719-911-19	DIODE 1SS119
D018	8-719-911-19	DIODE 1SS119
D019	8-719-911-19	DIODE 1SS119
D020	8-719-911-19	DIODE 1SS119
D021	8-719-911-19	DIODE 1SS119
D022	8-719-911-19	DIODE 1SS119
D023	8-719-911-19	DIODE 1SS119
D027	8-719-000-06	DIODE MC921
D029	8-719-100-57	DIODE RD10E-B2
D030	8-719-911-19	DIODE 1SS119
D031	8-719-911-19	DIODE 1SS119

When indicating parts by reference number, please include the board name.

No.	Part No.	Description	Remark
D036	8-719-911-19	DIODE 1SS119	
		DELAY LINE	
DL001	1-415-313-00	DELAY LINE (1H)	
DL401	1-415-352-11	DELAY LINE, 1H	
DL501	1-415-282-00	DELAY LINE	
		IC	
IC001	8-759-909-20	IC BA634	
IC002	8-759-904-95	IC BA7007	
IC003	8-759-201-68	IC CX10023	
IC004	8-759-208-94	IC CX894	
IC005	8-752-006-10	IC CX20061	
IC006	8-759-203-99	IC CX10021B-NP	
IC009	8-759-101-62	IC CX20043	
IC011	8-752-006-10	IC CX20061	
IC012	8-759-979-26	IC CX-7926	
IC401	8-758-662-00	IC CX-866B	
		COIL	
L001	1-407-499-00	MICRO INDUCTOR 3.9MMH	
L002	1-407-496-00	MICRO INDUCTOR 2.2MMH	
L003	1-408-408-00	MICRO INDUCTOR 8.2UH	
L004	1-408-406-00	MICRO INDUCTOR 5.6UH	
L005	1-408-415-00	MICRO INDUCTOR 33UH	
L006	1-408-428-00	MICRO INDUCTOR 390UH	
L007	1-408-427-00	MICRO INDUCTOR 330UH	
L008	1-408-421-00	MICRO INDUCTOR 100UH	
L010	1-408-427-00	MICRO INDUCTOR 330UH	
L011	1-408-423-00	MICRO INDUCTOR 150UH	
L012	1-408-409-00	MICRO INDUCTOR 10UH	
L014	1-408-416-00	MICRO INDUCTOR 39UH	
L015	1-408-419-00	MICRO INDUCTOR 68UH	
L016	1-408-413-00	MICRO INDUCTOR 22UH	
L017	1-408-423-00	MICRO INDUCTOR 150UH	
L018	1-408-419-00	MICRO INDUCTOR 68UH	
L019	1-408-416-00	MICRO INDUCTOR 39UH	
L020	1-408-416-00	MICRO INDUCTOR 39UH	
L021	1-408-422-00	MICRO INDUCTOR 120UH	
L022	1-408-424-00	MICRO INDUCTOR 180UH	
L023	1-408-422-00	MICRO INDUCTOR 120UH	
L026	1-408-416-00	MICRO INDUCTOR 39UH	
L036	1-408-429-00	MICRO INDUCTOR 470UH	
L041	1-408-424-00	MICRO INDUCTOR 180UH	
L401	1-408-397-00	MICRO INDUCTOR 1UH	
L402	1-408-397-00	MICRO INDUCTOR 1UH	
L501	1-408-408-00	MICRO INDUCTOR 8.2UH	
L502	1-408-423-00	MICRO INDUCTOR 150UH	
L601	1-408-416-00	MICRO INDUCTOR 39UH	
L602	1-408-416-00	MICRO INDUCTOR 39UH	
		LOW PASS FILTER	
LPF001	1-235-097-00	FILTER, LOW PASS	

No.	Part No.	Description	Remark
		VARIABLE COIL	
LV001	1-407-291-00	MICRO INDUCTOR 15MMH	
LV002	1-407-573-00	COIL, VARIABLE 47UH	
LV003	1-407-571-00	COIL, VARIABLE 22UH	
LV501	1-407-569-00	COIL, VARIABLE 10UH	
		IC LINK	
PS001⚠	1-532-685-00	LINK, IC 0.8A	
		TRANSISTOR	
Q010	8-729-177-43	TRANSISTOR 2SD774	
Q011	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q015	8-729-245-83	TRANSISTOR 2SC2458	
Q016	8-729-245-83	TRANSISTOR 2SC2458	
Q019	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q020	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q021	8-729-245-83	TRANSISTOR 2SC2458	
Q022	8-729-245-83	TRANSISTOR 2SC2458	
Q023	8-729-245-83	TRANSISTOR 2SC2458	
Q024	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q025	8-729-245-83	TRANSISTOR 2SC2458	
Q026	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q027	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q028	8-729-245-83	TRANSISTOR 2SC2458	
Q029	8-729-245-83	TRANSISTOR 2SC2458	
Q030	8-729-245-83	TRANSISTOR 2SC2458	
Q031	8-729-900-36	TRANSISTOR DTC124ES	
Q032	8-729-245-83	TRANSISTOR 2SC2458	
Q033	8-729-245-83	TRANSISTOR 2SC2458	
Q034	8-729-245-83	TRANSISTOR 2SC2458	
Q035	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q036	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q037	8-729-384-46	TRANSISTOR 2SA844-C	
Q038	8-729-384-46	TRANSISTOR 2SA844-C	
Q039	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q040	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q041	8-729-384-46	TRANSISTOR 2SA844-C	
Q042	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q043	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q044	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q045	8-729-384-46	TRANSISTOR 2SA844	
Q047	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q048	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q049	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q050	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q051	8-729-384-46	TRANSISTOR 2SA844-C	
Q052	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q053	8-729-384-46	TRANSISTOR 2SA844-C	
Q054	8-729-384-46	TRANSISTOR 2SA844-C	
Q055	8-729-384-46	TRANSISTOR 2SA844-C	
Q056	8-729-603-30	TRANSISTOR 2SC403SP-3	
Q060	8-729-204-83	TRANSISTOR 2SA1048-GR	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

YC-31

No.	Part No.	Description	Remark
Q061	8-729-245-83	TRANSISTOR 2SC2458	
Q062	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q063	8-729-245-83	TRANSISTOR 2SC2458	
Q064	8-729-245-83	TRANSISTOR 2SC2458	
Q065	8-729-245-83	TRANSISTOR 2SC2458	
Q067	8-729-245-83	TRANSISTOR 2SC2458	
Q068	8-729-245-83	TRANSISTOR 2SC2458	
Q069	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q071	8-729-245-83	TRANSISTOR 2SC2458	
Q075	8-729-900-85	TRANSISTOR DTC144WS	
Q100	8-729-900-85	TRANSISTOR DTC144WS	
Q101	8-729-900-89	TRANSISTOR DTC144ES	
Q102	8-729-900-65	TRANSISTOR DTA144ES	
Q103	8-729-245-83	TRANSISTOR 2SC2458	
Q401	8-729-245-83	TRANSISTOR 2SC2458	
Q501	8-729-245-83	TRANSISTOR 2SC2458	
Q502	8-729-245-83	TRANSISTOR 2SC2458	
Q503	8-729-245-83	TRANSISTOR 2SC2458	
Q504	8-729-245-83	TRANSISTOR 2SC2458	
Q617	8-729-205-02	TRANSISTOR 2SA1150	
Q620	8-729-204-83	TRANSISTOR 2SA1048-GR	

RESISTOR

No.	Part No.	Description				Remark
R026	1-247-871-00	CARBON	47K	5%	1/6W	
R028	1-247-855-00	CARBON	10K	5%	1/6W	
R029	1-247-867-00	CARBON	33K	5%	1/6W	
R030	1-247-867-00	CARBON	33K	5%	1/6W	
R032	1-247-815-00	CARBON	220	5%	1/6W	
R035	1-247-859-00	CARBON	15K	5%	1/6W	
R037	1-247-869-00	CARBON	39K	5%	1/6W	
R038	1-247-837-00	CARBON	1.8K	5%	1/6W	
R041	1-247-838-00	CARBON	2K	5%	1/6W	
R046	1-247-835-00	CARBON	1.5K	5%	1/6W	
R047	1-247-879-00	CARBON	100K	5%	1/6W	
R048	1-247-831-00	CARBON	1K	5%	1/6W	
R049	1-247-863-00	CARBON	22K	5%	1/6W	
R050	1-247-853-00	CARBON	8.2K	5%	1/6W	
R051	1-247-821-00	CARBON	390	5%	1/6W	
R052	1-247-819-00	CARBON	330	5%	1/6W	
R053	1-247-843-00	CARBON	3.3K	5%	1/6W	
R054	1-247-847-00	CARBON	4.7K	5%	1/6W	
R055	1-247-849-00	CARBON	5.6K	5%	1/6W	
R056	1-247-867-00	CARBON	33K	5%	1/6W	
R058	1-247-855-00	CARBON	10K	5%	1/6W	
R059	1-247-859-00	CARBON	15K	5%	1/6W	
R060	1-247-867-00	CARBON	33K	5%	1/6W	
R061	1-247-855-00	CARBON	10K	5%	1/6W	
R062	1-247-855-00	CARBON	10K	5%	1/6W	
R063	1-247-841-00	CARBON	2.7K	5%	1/6W	
R064	1-247-848-00	CARBON	5.1K	5%	1/6W	
R065	1-247-889-00	CARBON	270K	5%	1/6W	
R066	1-247-870-00	CARBON	43K	5%	1/6W	
R067	1-247-862-00	CARBON	20K	5%	1/6W	
R068	1-247-838-00	CARBON	2K	5%	1/6W	
R069	1-247-831-00	CARBON	1K	5%	1/6W	
R070	1-247-831-00	CARBON	1K	5%	1/6W	
R071	1-247-855-00	CARBON	10K	5%	1/6W	
R072	1-247-841-00	CARBON	2.7K	5%	1/6W	
R073	1-247-831-00	CARBON	1K	5%	1/6W	
R074	1-247-831-00	CARBON	1K	5%	1/6W	
R075	1-247-815-00	CARBON	220	5%	1/6W	
R076	1-247-855-00	CARBON	10K	5%	1/6W	
R077	1-247-855-00	CARBON	10K	5%	1/6W	
R078	1-247-867-00	CARBON	33K	5%	1/6W	
R079	1-247-855-00	CARBON	10K	5%	1/6W	
R080	1-247-853-00	CARBON	8.2K	5%	1/6W	
R081	1-247-843-00	CARBON	3.3K	5%	1/6W	
R082	1-247-871-00	CARBON	47K	5%	1/6W	
R083	1-247-825-00	CARBON	560	5%	1/6W	
R084	1-247-831-00	CARBON	1K	5%	1/6W	
R085	1-247-803-00	CARBON	68	5%	1/6W	
R086	1-247-825-00	CARBON	560	5%	1/6W	
R087	1-247-825-00	CARBON	560	5%	1/6W	
R088	1-247-807-00	CARBON	100	5%	1/6W	
R091	1-247-824-00	CARBON	510	5%	1/6W	
R092	1-247-791-00	CARBON	22	5%	1/6W	
R093	1-247-806-00	CARBON	91	5%	1/6W	
R094	1-247-869-00	CARBON	39K	5%	1/6W	
R095	1-247-872-00	CARBON	51K	5%	1/6W	
R096	1-247-879-00	CARBON	100K	5%	1/6W	
R097	1-247-882-00	CARBON	130K	5%	1/6W	
R098	1-247-890-00	CARBON	300K	5%	1/6W	
R100	1-247-869-00	CARBON	39K	5%	1/6W	
R101	1-247-864-00	CARBON	24K	5%	1/6W	
R103	1-247-831-00	CARBON	1K	5%	1/6W	
R104	1-247-839-00	CARBON	2.2K	5%	1/6W	
R105	1-247-829-00	CARBON	820	5%	1/6W	
R106	1-247-831-00	CARBON	1K	5%	1/6W	
R107	1-247-824-00	CARBON	510	5%	1/6W	
R108	1-247-839-00	CARBON	2.2K	5%	1/6W	
R109	1-247-867-00	CARBON	33K	5%	1/6W	
R111	1-247-846-00	CARBON	4.3K	5%	1/6W	
R112	1-247-857-00	CARBON	12K	5%	1/6W	
R113	1-247-843-00	CARBON	3.3K	5%	1/6W	
R114	1-247-828-00	CARBON	750	5%	1/6W	
R115	1-247-879-00	CARBON	100K	5%	1/6W	
R116	1-247-853-00	CARBON	8.2K	5%	1/6W	
R117	1-247-846-00	CARBON	4.3K	5%	1/6W	
R120	1-247-831-00	CARBON	1K	5%	1/6W	
R121	1-247-831-00	CARBON	1K	5%	1/6W	
R122	1-247-839-00	CARBON	2.2K	5%	1/6W	
R123	1-247-841-00	CARBON	2.7K	5%	1/6W	
R124	1-247-819-00	CARBON	330	5%	1/6W	
R125	1-247-831-00	CARBON	1K	5%	1/6W	
R126	1-247-831-00	CARBON	1K	5%	1/6W	
R127	1-247-835-00	CARBON	1.5K	5%	1/6W	

When indicating parts by reference number, please include the board name.

No.	Part No.	Description				Remark
R128	1-247-831-00	CARBON	1K	5%	1/6W	
R129	1-247-867-00	CARBON	33K	5%	1/6W	
R130	1-247-842-00	CARBON	3K	5%	1/6W	
R131	1-247-841-00	CARBON	2.7K	5%	1/6W	
R132	1-247-887-00	CARBON	220K	5%	1/6W	
R134	1-247-847-00	CARBON	4.7K	5%	1/6W	
R135	1-247-883-00	CARBON	150K	5%	1/6W	
R136	1-247-879-00	CARBON	100K	5%	1/6W	
R137	1-247-857-00	CARBON	12K	5%	1/6W	
R138	1-247-861-00	CARBON	18K	5%	1/6W	
R139	1-247-841-00	CARBON	2.7K	5%	1/6W	
R140	1-247-867-00	CARBON	33K	5%	1/6W	
R141	1-247-831-00	CARBON	1K	5%	1/6W	
R142	1-247-842-00	CARBON	3K	5%	1/6W	
R143	1-247-847-00	CARBON	4.7K	5%	1/6W	
R144	1-247-824-00	CARBON	510	5%	1/6W	
R145	1-247-838-00	CARBON	2K	5%	1/6W	
R146	1-247-829-00	CARBON	820	5%	1/6W	
R147	1-247-855-00	CARBON	10K	5%	1/6W	
R148	1-247-831-00	CARBON	1K	5%	1/6W	
R149	1-247-819-00	CARBON	330	5%	1/6W	
R150	1-247-863-00	CARBON	22K	5%	1/6W	
R151	1-247-812-00	CARBON	160	5%	1/6W	
R152	1-247-829-00	CARBON	820	5%	1/6W	
R153	1-247-863-00	CARBON	22K	5%	1/6W	
R154	1-247-821-00	CARBON	390	5%	1/6W	
R155	1-247-839-00	CARBON	2.2K	5%	1/6W	
R156	1-247-839-00	CARBON	2.2K	5%	1/6W	
R157	1-247-837-00	CARBON	1.8K	5%	1/6W	
R158	1-247-817-00	CARBON	270	5%	1/6W	
R159	1-247-810-00	CARBON	130	5%	1/6W	
R160	1-247-832-00	CARBON	1.1K	5%	1/6W	
R161	1-247-855-00	CARBON	10K	5%	1/6W	
R162	1-247-835-00	CARBON	1.5K	5%	1/6W	
R163	1-247-842-00	CARBON	3K	5%	1/6W	
R164	1-247-830-00	CARBON	910	5%	1/6W	
R165	1-247-834-00	CARBON	1.3K	5%	1/6W	
R166	1-247-818-00	CARBON	300	5%	1/6W	
R167	1-247-849-00	CARBON	5.6K	5%	1/6W	
R168	1-247-836-00	CARBON	1.6K	5%	1/6W	
R169	1-247-840-00	CARBON	2.4K	5%	1/6W	
R170	1-247-804-00	CARBON	75	5%	1/6W	
R171	1-247-901-00	CARBON	820K	5%	1/6W	
R172	1-247-857-00	CARBON	12K	5%	1/6W	
R173	1-247-861-00	CARBON	18K	5%	1/6W	
R174	1-247-839-00	CARBON	2.2K	5%	1/6W	
R175	1-247-831-00	CARBON	1K	5%	1/6W	
R176	1-247-839-00	CARBON	2.2K	5%	1/6W	
R178	1-247-839-00	CARBON	2.2K	5%	1/6W	
R179	1-247-843-00	CARBON	3.3K	5%	1/6W	
R180	1-247-835-00	CARBON	1.5K	5%	1/6W	
R181	1-247-835-00	CARBON	1.5K	5%	1/6W	
R185	1-247-843-00	CARBON	3.3K	5%	1/6W	
R186	1-247-830-00	CARBON	910	5%	1/6W	
R187	1-247-831-00	CARBON	1K	5%	1/6W	
R188	1-247-839-00	CARBON	2.2K	5%	1/6W	
R189	1-247-834-00	CARBON	1.3K	5%	1/6W	
R190	1-247-834-00	CARBON	1.3K	5%	1/6W	
R191	1-247-831-00	CARBON	1K	5%	1/6W	
R192	1-247-831-00	CARBON	1K	5%	1/6W	
R193	1-247-855-00	CARBON	10K	5%	1/6W	
R194	1-247-819-00	CARBON	330	5%	1/6W	
R195	1-247-812-00	CARBON	160	5%	1/6W	
R196	1-247-863-00	CARBON	22K	5%	1/6W	
R197	1-247-863-00	CARBON	22K	5%	1/6W	
R198	1-247-829-00	CARBON	820	5%	1/6W	
R199	1-247-821-00	CARBON	390	5%	1/6W	
R200	1-247-839-00	CARBON	2.2K	5%	1/6W	
R201	1-247-837-00	CARBON	1.8K	5%	1/6W	
R202	1-247-831-00	CARBON	1K	5%	1/6W	
R203	1-247-815-00	CARBON	220	5%	1/6W	
R204	1-247-811-00	CARBON	150	5%	1/6W	
R205	1-247-811-00	CARBON	150	5%	1/6W	
R206	1-247-834-00	CARBON	1.3K	5%	1/6W	
R207	1-247-874-00	CARBON	62K	5%	1/6W	
R208	1-247-874-00	CARBON	62K	5%	1/6W	
R209	1-247-833-00	CARBON	1.2K	5%	1/6W	
R210	1-247-824-00	CARBON	510	5%	1/6W	
R211	1-247-831-00	CARBON	1K	5%	1/6W	
R212	1-247-824-00	CARBON	510	5%	1/6W	
R213	1-247-829-00	CARBON	820	5%	1/6W	
R214	1-247-831-00	CARBON	1K	5%	1/6W	
R215	1-247-831-00	CARBON	1K	5%	1/6W	
R216	1-247-832-00	CARBON	1.1K	5%	1/6W	
R217	1-247-831-00	CARBON	1K	5%	1/6W	
R218	1-247-831-00	CARBON	1K	5%	1/6W	
R219	1-247-866-00	CARBON	30K	5%	1/6W	
R220	1-247-874-00	CARBON	62K	5%	1/6W	
R221	1-247-849-00	CARBON	5.6K	5%	1/6W	
R222	1-247-837-00	CARBON	1.8K	5%	1/6W	
R223	1-247-837-00	CARBON	1.8K	5%	1/6W	
R231	1-247-867-00	CARBON	33K	5%	1/6W	
R235	1-247-831-00	CARBON	1K	5%	1/6W	
R236	1-247-853-00	CARBON	8.2K	5%	1/6W	
R239	1-247-855-00	CARBON	10K	5%	1/6W	
R241	1-247-804-00	CARBON	75	5%	1/6W	
R242	1-247-879-00	CARBON	100K	5%	1/6W	
R243	1-247-855-00	CARBON	10K	5%	1/6W	
R244	1-247-851-00	CARBON	6.8K	5%	1/6W	
R245	1-247-879-00	CARBON	100K	5%	1/6W	
R246	1-247-871-00	CARBON	47K	5%	1/6W	
R247	1-247-871-00	CARBON	47K	5%	1/6W	
R248	1-247-818-00	CARBON	300	5%	1/6W	
R249	1-247-813-00	CARBON	180	5%	1/6W	
R250	1-247-811-00	CARBON	150	5%	1/6W	
R251	1-247-838-00	CARBON	2K	5%	1/6W	

When indicating parts by reference number, please include the board name.

YC-31

No.	Part No.	Description				Remark
R252	1-247-803-00	CARBON	68	5%	1/6W	
R254	1-247-855-00	CARBON	10K	5%	1/6W	
R255	1-247-858-00	CARBON	13K	5%	1/6W	
R256	1-247-843-00	CARBON	3.3K	5%	1/6W	
R257	1-247-835-00	CARBON	1.5K	5%	1/6W	
R258	1-247-852-00	CARBON	7.5K	5%	1/6W	
R259	1-247-831-00	CARBON	1K	5%	1/6W	
R260	1-247-841-00	CARBON	2.7K	5%	1/6W	
R261	1-247-863-00	CARBON	22K	5%	1/6W	
R262	1-247-849-00	CARBON	5.6K	5%	1/6W	
R274	1-247-883-00	CARBON	150K	5%	1/6W	
R275	1-247-871-00	CARBON	47K	5%	1/6W	
R276	1-247-849-00	CARBON	5.6K	5%	1/6W	
R277	1-247-855-00	CARBON	10K	5%	1/6W	
R280	1-247-821-00	CARBON	390	5%	1/6W	
R281	1-247-883-00	CARBON	150K	5%	1/6W	
R282	1-247-819-00	CARBON	330	5%	1/6W	
R283	1-247-838-00	CARBON	2K	5%	1/6W	
R284	1-247-877-00	CARBON	82K	5%	1/6W	
R286	1-247-848-00	CARBON	5.1K	5%	1/6W	
R287	1-247-831-00	CARBON	1K	5%	1/6W	
R291	1-247-863-00	CARBON	22K	5%	1/6W	
R292	1-247-875-00	CARBON	68K	5%	1/6W	
R293	1-247-819-00	CARBON	330	5%	1/6W	
R295	1-247-839-00	CARBON	2.2K	5%	1/6W	
R296	1-247-811-00	CARBON	150	5%	1/6W	
R298	1-247-894-00	CARBON	430K	5%	1/6W	
R299	1-247-892-00	CARBON	360K	5%	1/6W	
R301	1-247-855-00	CARBON	10K	5%	1/6W	
R302	1-247-819-00	CARBON	330	5%	1/6W	
R303	1-247-819-00	CARBON	330	5%	1/6W	
R304	1-247-847-00	CARBON	4.7K	5%	1/6W	
R305	1-247-835-00	CARBON	1.5K	5%	1/6W	
R312	1-247-847-00	CARBON	4.7K	5%	1/6W	
R313	1-247-823-00	CARBON	470	5%	1/6W	
R317	1-247-855-00	CARBON	10K	5%	1/6W	
R318	1-247-865-00	CARBON	27K	5%	1/6W	
R320	1-247-878-00	CARBON	91K	5%	1/6W	
R321	1-247-887-00	CARBON	220K	5%	1/6W	
R325	1-247-807-00	CARBON	100	5%	1/6W	
R331	1-247-852-00	CARBON	7.5K	5%	1/6W	
R342	1-247-807-00	CARBON	100	5%	1/6W	
R346	1-247-847-00	CARBON	4.7K	5%	1/6W	
R351	1-247-815-00	CARBON	220	5%	1/6W	
R352	1-247-855-00	CARBON	10K	5%	1/6W	
R353	1-247-831-00	CARBON	1K	5%	1/6W	
R357	1-247-829-00	CARBON	820	5%	1/6W	
R358	1-247-855-00	CARBON	10K	5%	1/6W	
R359	1-247-839-00	CARBON	2.2K	5%	1/6W	
R370	1-247-790-00	CARBON	20	5%	1/6W	
R401	1-247-810-00	CARBON	130	5%	1/6W	
R402	1-247-808-00	CARBON	110	5%	1/6W	
R403	1-247-867-00	CARBON	33K	5%	1/6W	

No.	Part No.	Description				Remark
R404	1-247-871-00	CARBON	47K	5%	1/6W	
R405	1-247-831-00	CARBON	1K	5%	1/6W	
R406	1-247-832-00	CARBON	1.1K	5%	1/6W	
R407	1-247-832-00	CARBON	1.1K	5%	1/6W	
R408	1-247-849-00	CARBON	5.6K	5%	1/6W	
R409	1-247-831-00	CARBON	1K	5%	1/6W	
R410	1-247-831-00	CARBON	1K	5%	1/6W	
R411	1-247-847-00	CARBON	4.7K	5%	1/6W	
R412	1-247-828-00	CARBON	750	5%	1/6W	
R413	1-247-812-00	CARBON	160	5%	1/6W	
R414	1-247-847-00	CARBON	4.7K	5%	1/6W	
R415	1-247-831-00	CARBON	1K	5%	1/6W	
R416	1-247-846-00	CARBON	4.3K	5%	1/6W	
R510	1-247-824-00	CARBON	510	5%	1/6W	
R511	1-247-867-00	CARBON	33K	5%	1/6W	
R512	1-247-847-00	CARBON	4.7K	5%	1/6W	
R513	1-247-863-00	CARBON	22K	5%	1/6W	
R514	1-247-821-00	CARBON	390	5%	1/6W	
R515	1-247-839-00	CARBON	2.2K	5%	1/6W	
R516	1-247-821-00	CARBON	390	5%	1/6W	
R517	1-247-821-00	CARBON	390	5%	1/6W	
R518	1-247-821-00	CARBON	390	5%	1/6W	
R519	1-247-821-00	CARBON	390	5%	1/6W	
R520	1-247-839-00	CARBON	2.2K	5%	1/6W	
R521	1-247-821-00	CARBON	390	5%	1/6W	
R522	1-247-839-00	CARBON	2.2K	5%	1/6W	
R525	1-247-843-00	CARBON	3.3K	5%	1/6W	
R601	1-247-847-00	CARBON	4.7K	5%	1/6W	
R603	1-247-843-00	CARBON	3.3K	5%	1/6W	
R632	1-247-855-00	CARBON	10K	5%	1/6W	
R633	1-247-831-00	CARBON	1K	5%	1/6W	
R635	1-247-883-00	CARBON	150K	5%	1/6W	
R638	1-247-807-00	CARBON	100	5%	1/6W	
R639	1-247-831-00	CARBON	1K	5%	1/6W	
R640	1-247-815-00	CARBON	220	5%	1/6W	
R641	1-247-831-00	CARBON	1K	5%	1/6W	
R643	1-247-883-00	CARBON	150K	5%	1/6W	
R644	1-247-818-00	CARBON	300	5%	1/6W	
R646	1-247-859-00	CARBON	15K	5%	1/6W	

VARIABLE RESISTOR

No.	Part No.	Description	Remark
RV001	1-228-989-00	RES, ADJ, METAL GLAZE 470	
RV002	1-228-748-00	RES, ADJ, CARBON 10K	
RV003	1-228-750-00	RES, ADJ, CARBON 47K	
RV005	1-228-750-00	RES, ADJ, CARBON 47K	
RV006	1-228-749-00	RES, ADJ, CARBON 22K	
RV007	1-228-748-00	RES, ADJ, CARBON 10K	
RV008	1-228-745-00	RES, ADJ, CARBON 1K	
RV009	1-228-996-00	RES, ADJ, METAL GLAZE 47K	
RV010	1-228-749-00	RES, ADJ, CARBON 22K	
RV012	1-228-750-00	RES, ADJ, CARBON 47K	
RV013	1-228-750-00	RES, ADJ, CARBON 47K	
RV014	1-228-748-00	RES, ADJ, CARBON 10K	

When indicating parts by reference number, please include the board name.

No.	Part No.	Description	Remark
RV015	1-228-989-00	RES, ADJ, METAL GLAZE 470	
RV016	1-228-745-00	RES, ADJ, CARBON 1K	
RV019	1-228-993-00	RES, ADJ, METAL GLAZE 4.7K	
RV020	1-228-745-00	RES, ADJ, CARBON 1K	
RV021	1-228-750-00	RES, ADJ, CARBON 47K	
RV401	1-228-994-00	RES, ADJ, METAL GLAZE 10K	
RV501	1-228-989-00	RES, ADJ, METAL GLAZE 470	
RV602	1-228-990-00	RES, ADJ, METAL GLAZE 1K	

SWITCH

No.	Part No.	Description
S601	1-553-725-21	SWITCH, SLIDE

TRANSFORMER

No.	Part No.	Description
T001	1-426-093-00	COIL, REC C BPT

CRYSTAL

No.	Part No.	Description
X001	1-527-345-00	CRYSTAL, OSC

****

*A-6715-239-A SS-34 BOARD, COMPLETE
****

Part No.	Description
*3-681-170-00	HEAT SINK, S
*3-846-049-11	PIN, LEAD
7-621-770-87	SCREW +B 2.6X5

CAPACITOR

No.	Part No.	Description			Remark
C304	1-123-332-00	ELECT	47MF	20%	16V
C305	1-123-345-00	ELECT	100MF	20%	35V
C306	1-123-332-00	ELECT	47MF	20%	16V
C307	1-130-479-00	MYLAR	0.0047MF	5%	50V
C308	1-123-332-00	ELECT	47MF	20%	16V
C309	1-123-381-00	ELECT	2.2MF	20%	50V
C310	1-161-013-00	CERAMIC	0.01MF	10%	25V
C311	1-127-477-00	ELECT(SOLID)	0.47MF	5%	25V
C312	1-123-332-00	ELECT	47MF	20%	16V
C313	1-161-059-00	CERAMIC	0.047MF	10%	25V
C314	1-131-357-00	TANTALUM	4.7MF	20%	25V
C315	1-123-381-00	ELECT	2.2MF	20%	50V
C316	1-131-357-00	TANTALUM	4.7MF	20%	25V
C317	1-161-059-00	CERAMIC	0.047MF	10%	25V
C318	1-123-381-00	ELECT	2.2MF	20%	50V
C319	1-161-013-00	CERAMIC	0.01MF	10%	25V
C320	1-161-054-00	CERAMIC	0.018MF	10%	25V
C321	1-123-356-00	ELECT	10MF	20%	16V
C322	1-123-330-00	ELECT	22MF	20%	16V
C323	1-124-429-00	ELECT	0.68MF	20%	50V
C324	1-161-059-00	CERAMIC	0.047MF	10%	25V
C325	1-161-059-00	CERAMIC	0.047MF	10%	25V
C326	1-123-330-00	ELECT	22MF	20%	16V
C327	1-130-483-00	MYLAR	0.01MF	5%	50V
C328	1-130-483-00	MYLAR	0.01MF	5%	50V
C329	1-161-059-00	CERAMIC	0.047MF	10%	25V
C330	1-123-382-00	ELECT	3.3MF	20%	50V
C331	1-161-059-00	CERAMIC	0.047MF	10%	25V
C332	1-123-298-00	ELECT	470MF	20%	6.3V
C333	1-123-298-00	ELECT	470MF	20%	6.3V
C334	1-123-382-00	ELECT	3.3MF	20%	50V
C335	1-123-382-00	ELECT	3.3MF	20%	50V
C336	1-161-059-00	CERAMIC	0.047MF	10%	25V
C337	1-130-482-00	MYLAR	0.0082MF	5%	50V
C338	1-123-382-00	ELECT	3.3MF	20%	50V
C339	1-161-054-00	CERAMIC	0.018MF	10%	25V
C340	1-161-013-00	CERAMIC	0.01MF	10%	25V
C341	1-161-013-00	CERAMIC	0.01MF	10%	25V
C342	1-161-054-00	CERAMIC	0.018MF	10%	25V
C343	1-127-479-51	ELECT(SOLID)	1MF	5%	25V
C344	1-161-055-00	CERAMIC	0.022MF	10%	25V
C345	1-161-040-00	CERAMIC	0.0012MF	10%	25V
C346	1-161-054-00	CERAMIC	0.018MF	10%	25V
C347	1-161-054-00	CERAMIC	0.018MF	10%	25V
C351	1-161-057-00	CERAMIC	0.033MF	10%	25V
C352	1-123-381-00	ELECT	2.2MF	20%	50V
C353	1-161-057-00	CERAMIC	0.033MF	10%	25V
C354	1-123-343-00	ELECT	33MF	20%	25V
C355	1-123-343-00	ELECT	33MF	20%	25V
C356	1-123-321-00	ELECT	220MF	20%	16V
C357	1-161-059-00	CERAMIC	0.047MF	10%	25V
C358	1-123-333-00	ELECT	100MF	20%	16V
C359	1-123-617-00	ELECT	10MF	20%	16V
C361	1-123-821-00	ELECT	47MF	20%	16V
C362	1-123-345-00	ELECT	100MF	20%	35V
C364	1-161-059-00	CERAMIC	0.047MF	10%	25V
C365	1-123-380-00	ELECT	1MF	20%	50V
C366	1-161-013-00	CERAMIC	0.01MF	10%	25V
C367	1-161-059-00	CERAMIC	0.047MF	10%	25V
C368	1-161-043-00	CERAMIC	0.0022MF	10%	50V
C370	1-161-063-00	CERAMIC	0.1MF	20%	25V
C601	1-123-318-00	ELECT	33MF	20%	16V
C603	1-123-330-00	ELECT	22MF	20%	16V
C604	1-161-055-00	CERAMIC	0.022MF	10%	25V
C605	1-161-059-00	CERAMIC	0.047MF	10%	25V
C606	1-161-059-00	CERAMIC	0.047MF	10%	25V
C607	1-129-794-00	FILM	0.0033MF	5%	100V
C608	1-129-794-00	FILM	0.0033MF	2%	100V
C611	1-102-529-00	CERAMIC	100PF	5%	50V
C612	1-102-529-00	CERAMIC	100PF	5%	50V
C613	1-123-318-00	ELECT	33MF	20%	10V
C616	1-123-382-00	ELECT	3.3MF	20%	50V
C650	1-161-773-00	CERAMIC	0.1MF	20%	25V
C651	1-161-047-00	CERAMIC	0.0047MF	10%	25V
C652	1-123-381-00	ELECT	2.2MF	20%	50V
C656	1-102-832-00	CERAMIC	330PF	10%	50V
C657	1-102-832-00	CERAMIC	330PF	10%	50V
C658	1-101-004-00	CERAMIC	0.01MF		50V

When indicating parts by reference number, please include the board name.

SS-34

No.	Part No.	Description	Remark
		FILTER	
CF601	1-527-992-11	OSCILLATOR, CERAMIC	
		CONNECTOR	
CN301	*1-564-029-00	PIN, CONNECTOR 4P	
CN302	*1-560-466-00	PIN, CONNECTOR 3P	
CN303	*1-560-892-00	PIN, CONNECTOR 4P	
CN304	*1-560-892-00	PIN, CONNECTOR 4P	
CN305	*1-560-890-00	PIN, CONNECTOR 2P	
CN306	*1-560-894-00	PIN, CONNECTOR 6P	
CN307	*1-560-890-00	PIN, CONNECTOR 2P	
CN308	*1-560-892-00	PIN, CONNECTOR 4P	
CN309	*1-560-895-00	PIN, CONNECTOR 7P	
CN310	*1-560-891-00	PIN, CONNECTOR 3P	
CN311	*1-560-891-00	PIN, CONNECTOR 3P	
CN601	*1-560-891-00	PIN, CONNECTOR 3P	
CN602	*1-560-896-00	PIN, CONNECTOR 8P	
CN603	*1-560-890-00	PIN, CONNECTOR 2P	
CN604	*1-560-890-00	PIN, CONNECTOR 2P	
CN605	*1-560-893-00	PIN, CONNECTOR 5P	
CN606	*1-560-890-00	PIN, CONNECTOR 2P	
CN607	*1-560-891-00	PIN, CONNECTOR 3P	
CN608	*1-560-890-00	PIN, CONNECTOR 2P	
CN609	*1-560-894-00	PIN, CONNECTOR 6P	
CN610	*1-560-896-00	PIN, CONNECTOR 8P	
CN611	*1-560-891-00	PIN, CONNECTOR 3P	
CN612	*1-560-891-00	PIN, CONNECTOR 3P	
		DIODE	
D301	8-719-000-06	DIODE MC921	
D302	8-719-000-04	DIODE MC911	
D303	8-719-911-19	DIODE 1SS119	
D304	8-719-101-50	DIODE RD5.1E-L2	
D305	8-719-911-19	DIODE 1SS119	
D308	8-719-000-12	DIODE MC931	
D316	8-719-911-19	DIODE 1SS119	
D319	8-719-100-29	DIODE RD5.1E-B1	
D321	8-719-911-19	DIODE 1SS119	
D601	8-719-000-06	DIODE MC921	
D602	8-719-000-06	DIODE MC921	
D603	8-719-000-04	DIODE MC911	
D608	8-719-911-19	DIODE 1SS119	
		IC	
IC301	8-751-941-05	IC CX194B-5	
IC302	8-759-135-80	IC UPC358C	
IC303	8-759-145-58	IC UPC4558C	
IC304	8-759-132-40	IC UPC324C	
IC305	8-759-240-53	IC TC4053BP	
IC306	8-759-132-40	IC UPC324C	
IC601	8-759-911-08	IC MB88551-133M	
IC602	8-759-800-72	IC LA7205	
IC603	8-759-600-24	IC M54543L	
		COIL	
L601	1-407-492-00	MICRO INDUCTOR 1MMH	
		IC LINK	
PS301⚠	1-532-637-00	LINK, IC 1A	
PS302⚠	1-532-679-00	LINK, IC 0.6A	
PS303⚠	1-532-605-00	LINK, IC 0.4A	
PS304⚠	1-532-637-00	LINK, IC 1A	
		TRANSISTOR	
Q301	8-729-245-83	TRANSISTOR 2SC2458	
Q302	8-729-900-89	TRANSISTOR DTC144ES	
Q303	8-729-245-83	TRANSISTOR 2SC2458	
Q304	8-729-245-83	TRANSISTOR 2SC2458	
Q305	8-729-245-83	TRANSISTOR 2SC2458	
Q306	8-729-900-89	TRANSISTOR DTC144ES	
Q307	8-729-200-20	TRANSISTOR 2SK107-2	
Q308	8-729-245-83	TRANSISTOR 2SC2458	
Q312	8-729-245-83	TRANSISTOR 2SC2458	
Q313	8-729-245-83	TRANSISTOR 2SC2458	
Q314	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q315	8-729-316-16	TRANSISTOR 2SC1061	
Q316	8-729-245-83	TRANSISTOR 2SC2458	
Q317	8-729-245-83	TRANSISTOR 2SC2458	
Q318	8-729-245-83	TRANSISTOR 2SC2458	
Q321	8-729-177-43	TRANSISTOR 2SD774	
Q322	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q323	8-729-805-13	TRANSISTOR 2SC1475-13	
Q324	8-729-117-54	TRANSISTOR 2SA1175	
Q325	8-729-245-83	TRANSISTOR 2SC2458	
Q326	8-729-245-83	TRANSISTOR 2SC2458	
Q330	8-729-316-16	TRANSISTOR 2SC1061	
Q331	8-729-245-83	TRANSISTOR 2SC2458	
Q332	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q333	8-729-900-89	TRANSISTOR DTC144ES	
Q335	8-729-245-83	TRANSISTOR 2SC2458	
Q336	8-729-245-83	TRANSISTOR 2SC2458	
Q337	8-729-245-83	TRANSISTOR 2SC2458	
Q338	8-729-245-83	TRANSISTOR 2SC2458	
Q340	8-729-177-43	TRANSISTOR 2SD774	
Q341	8-729-900-89	TRANSISTOR DTC144ES	
Q342	8-729-900-89	TRANSISTOR DTC144ES	
Q343	8-729-245-83	TRANSISTOR 2SC2458	
Q344	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q345	8-729-900-65	TRANSISTOR DTA144ES	
Q346	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q347	8-729-900-89	TRANSISTOR DTC144ES	
Q349	8-729-900-89	TRANSISTOR DTC144ES	
Q601	8-729-116-42	TRANSISTOR 2SD1164	
Q602	8-729-116-42	TRANSISTOR 2SD1164	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

No.	Part No.	Description	Remark
Q603	8-729-177-43	TRANSISTOR 2SD774	
Q604	8-729-177-43	TRANSISTOR 2SD774	
Q615	8-729-900-69	TRANSISTOR DTA144WS	
Q617	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q618	8-729-245-83	TRANSISTOR 2SC2458	
Q619	8-729-245-83	TRANSISTOR 2SC2458	
Q620	8-729-900-89	TRANSISTOR DTC144ES	
Q621	8-729-245-83	TRANSISTOR 2SC2458	
Q623	8-729-245-83	TRANSISTOR 2SC2458	
Q624	8-729-900-61	TRANSISTOR DTA114ES	

RESISTOR

No.	Part No.	Description				Remark
R301	1-247-871-00	CARBON	47K	5%	1/6W	
R302	1-247-859-00	CARBON	15K	5%	1/6W	
R303	1-247-871-00	CARBON	47K	5%	1/6W	
R304	1-247-859-00	CARBON	15K	5%	1/6W	
R305	1-247-855-00	CARBON	10K	5%	1/6W	
R307	1-247-855-00	CARBON	10K	5%	1/6W	
R308	1-247-829-00	CARBON	820	5%	1/6W	
R309	1-247-881-00	CARBON	120K	5%	1/6W	
R310	1-247-835-00	CARBON	1.5K	5%	1/6W	
R311	1-247-863-00	CARBON	22K	5%	1/6W	
R312	1-247-864-00	CARBON	24K	5%	1/6W	
R313	1-247-831-00	CARBON	1K	5%	1/6W	
R314	1-247-835-00	CARBON	1.5K	5%	1/6W	
R315	1-247-829-00	CARBON	820	5%	1/6W	
R316	1-247-879-00	CARBON	100K	5%	1/6W	
R317	1-247-903-00	CARBON	1M	5%	1/6W	
R318	1-247-885-00	CARBON	180K	5%	1/6W	
R319	1-247-844-00	CARBON	3.6K	5%	1/6W	
R320	1-247-859-00	CARBON	15K	5%	1/6W	
R321	1-247-845-00	CARBON	3.9K	5%	1/6W	
R322	1-247-903-00	CARBON	1M	5%	1/6W	
R323	1-247-855-00	CARBON	10K	5%	1/6W	
R324	1-247-831-00	CARBON	1K	5%	1/6W	
R325	1-247-903-00	CARBON	1M	5%	1/6W	
R326	1-247-831-00	CARBON	1K	5%	1/6W	
R327	1-247-855-00	CARBON	10K	5%	1/6W	
R328 ⚠	1-212-850-00	FUSIBLE	5.1	5%	1/4W	F
R329	1-247-857-00	CARBON	12K	5%	1/6W	
R330	1-247-859-00	CARBON	15K	5%	1/6W	
R331	1-247-847-00	CARBON	4.7K	5%	1/6W	
R332	1-247-873-00	CARBON	56K	5%	1/6W	
R333	1-247-900-00	CARBON	750K	5%	1/6W	
R334	1-247-867-00	CARBON	33K	5%	1/6W	
R335	1-247-867-00	CARBON	33K	5%	1/6W	
R336	1-247-856-00	CARBON	11K	5%	1/6W	
R337	1-247-855-00	CARBON	10K	5%	1/6W	
R338	1-247-842-00	CARBON	3K	5%	1/6W	
R339	1-247-843-00	CARBON	3.3K	5%	1/6W	
R340	1-247-825-00	CARBON	560	5%	1/6W	
R341	1-247-871-00	CARBON	47K	5%	1/6W	
R342	1-247-855-00	CARBON	10K	5%	1/6W	
R343	1-247-865-00	CARBON	27K	5%	1/6W	
R344	1-247-872-00	CARBON	51K	5%	1/6W	
R345	1-247-865-00	CARBON	27K	5%	1/6W	
R346	1-247-848-00	CARBON	5.1K	5%	1/6W	
R347	1-247-887-00	CARBON	220K	5%	1/6W	
R348	1-247-887-00	CARBON	220K	5%	1/6W	
R349	1-247-845-00	CARBON	3.9K	5%	1/6W	
R352	1-247-871-00	CARBON	47K	5%	1/6W	
R353	1-247-867-00	CARBON	33K	5%	1/6W	
R354	1-247-855-00	CARBON	10K	5%	1/6W	
R355	1-247-887-00	CARBON	220K	5%	1/6W	
R356	1-247-871-00	CARBON	47K	5%	1/6W	
R357	1-247-871-00	CARBON	47K	5%	1/6W	
R358	1-247-863-00	CARBON	22K	5%	1/6W	
R359	1-247-863-00	CARBON	22K	5%	1/6W	
R361	1-247-871-00	CARBON	47K	5%	1/6W	
R362	1-247-861-00	CARBON	18K	5%	1/6W	
R363	1-247-879-00	CARBON	100K	5%	1/6W	
R364	1-247-867-00	CARBON	33K	5%	1/6W	
R365	1-247-867-00	CARBON	33K	5%	1/6W	
R366	1-247-867-00	CARBON	33K	5%	1/6W	
R367	1-247-859-00	CARBON	15K	5%	1/6W	
R368 ⚠	1-206-482-00	METAL OXIDE	62	5%	2W	F
R370	1-247-871-00	CARBON	47K	5%	1/6W	
R371	1-247-867-00	CARBON	33K	5%	1/6W	
R372	1-247-855-00	CARBON	10K	5%	1/6W	
R373	1-247-883-00	CARBON	150K	5%	1/6W	
R374	1-247-883-00	CARBON	150K	5%	1/6W	
R375	1-247-883-00	CARBON	150K	5%	1/6W	
R376	1-247-883-00	CARBON	150K	5%	1/6W	
R377	1-247-879-00	CARBON	100K	5%	1/6W	
R378	1-247-879-00	CARBON	100K	5%	1/6W	
R379	1-247-879-00	CARBON	100K	5%	1/6W	
R380	1-247-879-00	CARBON	100K	5%	1/6W	
R381	1-247-867-00	CARBON	33K	5%	1/6W	
R382	1-247-867-00	CARBON	33K	5%	1/6W	
R383	1-247-897-00	CARBON	560K	5%	1/6W	
R384	1-247-897-00	CARBON	560K	5%	1/6W	
R386	1-247-857-00	CARBON	12K	5%	1/6W	
R387	1-246-981-00	CARBON	4.7	5%	1/8W	F
R389 ⚠	1-212-366-00	METAL OXIDE	3.3	5%	1W	F
R390	1-247-855-00	CARBON	10K	5%	1/6W	
R391	1-247-845-00	CARBON	3.9K	5%	1/6W	
R392	1-247-819-00	CARBON	330	5%	1/6W	
R394	1-247-832-00	CARBON	1.1K	5%	1/6W	
R397	1-247-831-00	CARBON	1K	5%	1/6W	
R398 ⚠	1-212-849-00	FUSIBLE	4.7	5%	1/4W	F
R399 ⚠	1-212-360-00	METAL OXIDE	1	5%	1W	F
R400	1-247-828-00	CARBON	750	5%	1/6W	
R406 ⚠	1-212-360-00	METAL OXIDE	1	5%	1W	F
R407	1-247-847-00	CARBON	4.7K	5%	1/6W	
R408	1-247-843-00	CARBON	3.3K	5%	1/6W	
R409	1-247-838-00	CARBON	2K	5%	1/6W	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

No.	Part No.	Description				Remark
R410	1-247-847-00	CARBON	4.7K	5%	1/6W	
R411	1-247-855-00	CARBON	10K	5%	1/6W	
R413	1-247-847-00	CARBON	4.7K	5%	1/6W	
R417	1-247-837-00	CARBON	1.8K	5%	1/6W	
R419	1-247-855-00	CARBON	10K	5%	1/6W	
R426	1-247-831-00	CARBON	1K	5%	1/6W	
R427	1-247-863-00	CARBON	22K	5%	1/6W	
R428	1-247-863-00	CARBON	22K	5%	1/6W	
R429	1-247-848-00	CARBON	5.1K	5%	1/6W	
R430	1-247-859-00	CARBON	15K	5%	1/6W	
R431	1-247-867-00	CARBON	33K	5%	1/6W	
R432	1-247-871-00	CARBON	47K	5%	1/6W	
R433	1-247-831-00	CARBON	1K	5%	1/6W	
R436	1-247-855-00	CARBON	10K	5%	1/6W	
R437	1-247-855-00	CARBON	10K	5%	1/6W	
R438	1-247-851-00	CARBON	6.8K	5%	1/6W	
R439	1-247-839-00	CARBON	2.2K	5%	1/6W	
R440	1-247-855-00	CARBON	10K	5%	1/6W	
R441	1-247-867-00	CARBON	33K	5%	1/6W	
R442	1-247-847-00	CARBON	4.7K	5%	1/6W	
R443	1-247-831-00	CARBON	1K	5%	1/6W	
R444	1-247-855-00	CARBON	10K	5%	1/6W	
R445	1-247-839-00	CARBON	2.2K	5%	1/6W	
R446	1-247-851-00	CARBON	6.8K	5%	1/6W	
R447	1-247-855-00	CARBON	10K	5%	1/6W	
R448	1-247-863-00	CARBON	22K	5%	1/6W	
R449	1-247-871-00	CARBON	47K	5%	1/6W	
R451	1-247-815-00	CARBON	220	5%	1/6W	
R452	1-247-847-00	CARBON	4.7K	5%	1/6W	
R454	1-247-843-00	CARBON	3.3K	5%	1/6W	
R455	1-247-843-00	CARBON	3.3K	5%	1/6W	
R461	1-247-843-00	CARBON	3.3K	5%	1/6W	
R462	1-247-903-00	CARBON	1M	5%	1/6W	
R463	1-247-871-00	CARBON	47K	5%	1/6W	
R464	1-247-871-00	CARBON	47K	5%	1/6W	
R465	1-247-863-00	CARBON	22K	5%	1/6W	
R467	1-247-847-00	CARBON	4.7K	5%	1/6W	
R469	1-247-863-00	CARBON	22K	5%	1/6W	
R471	1-247-825-00	CARBON	560	5%	1/6W	
R473	1-247-843-00	CARBON	3.3K	5%	1/6W	
R601	1-247-835-00	CARBON	1.5K	5%	1/6W	
R602	1-247-864-00	CARBON	24K	5%	1/6W	
R603	1-247-864-00	CARBON	24K	5%	1/6W	
R604	1-247-864-00	CARBON	24K	5%	1/6W	
R612	1-247-827-00	CARBON	680	5%	1/6W	
R614	1-247-845-00	CARBON	3.9K	5%	1/6W	
R615	1-247-855-00	CARBON	10K	5%	1/6W	
R616	1-247-845-00	CARBON	3.9K	5%	1/6W	
R617	1-247-855-00	CARBON	10K	5%	1/6W	
R618	1-215-454-00	METAL	24K	1%	1/6W	
R619	1-247-863-00	CARBON	22K	5%	1/6W	
R620	1-247-873-00	CARBON	56K	5%	1/6W	
R621	1-247-851-00	CARBON	6.8K	5%	1/6W	
R622	1-247-855-00	CARBON	10K	5%	1/6W	
R623	1-247-861-00	CARBON	18K	5%	1/6W	
R636	1-247-835-00	CARBON	1.5K	5%	1/6W	
R637	1-247-104-00	CARBON	75	5%	1/4W	
R640	1-247-875-00	CARBON	68K	5%	1/6W	
R643	1-247-839-00	CARBON	2.2K	5%	1/6W	
R644	1-247-864-00	CARBON	24K	5%	1/6W	
R645	1-247-871-00	CARBON	47K	5%	1/6W	
R646	1-247-851-00	CARBON	6.8K	5%	1/6W	
R648	1-247-107-00	CARBON	100	5%	1/4W	

VARIABLE RESISTOR

No.	Part No.	Description
RV301	1-228-994-00	RES, ADJ, METAL GLAZE 10K
RV302	1-228-994-00	RES, ADJ, METAL GLAZE 10K
RV303	1-228-996-00	RES, ADJ, METAL GLAZE 47K
RV304	1-228-750-00	RES, ADJ, CARBON 47K
RV305	1-228-750-00	RES, ADJ, CARBON 47K
RV306	1-228-750-00	RES, ADJ, CARBON 47K
RV307	1-228-991-00	RES, ADJ, METAL GLAZE 2.2K
RV308	1-228-990-00	RES, ADJ, METAL GLAZE 1K

THERMISTOR

No.	Part No.	Description
TH301	1-800-200-00	THERMISTOR S-3K
TH302	1-800-198-XX	THERMISTOR S-1K

****

*1-613-231-12 FU-25 BOARD

****

DIODE

No.	Part No.	Description
D001	8-719-812-33	DIODE TLG123A

RESISTOR

No.	Part No.	Description			
R001	1-247-123-00	CARBON	470	5%	1/4W
R002	1-247-851-00	CARBON	6.8K	5%	1/6W
R003	1-247-851-00	CARBON	6.8K	5%	1/6W
R004	1-247-855-00	CARBON	10K	5%	1/6W
R005	1-247-855-00	CARBON	10K	5%	1/6W
R006	1-247-861-00	CARBON	18K	5%	1/6W

VARIABLE RESISTOR

No.	Part No.	Description
RV001	1-230-421-11	RES, VAR, CARBON 100K

SWITCH

No.	Part No.	Description
S001	1-554-174-00	SWITCH, KEY BOARD
S002	1-554-174-00	SWITCH, KEY BOARD
S003	1-554-174-00	SWITCH, KEY BOARD
S004	1-554-174-00	SWITCH, KEY BOARD
S005	1-554-174-00	SWITCH, KEY BOARD
S006	1-554-174-00	SWITCH, KEY BOARD
S007	1-554-174-00	SWITCH, KEY BOARD
S008	1-554-174-00	SWITCH, KEY BOARD

When indicating parts by reference number, please include the board name.

No.	Part No.	Description	Remark
	*A-6721-222-A	TA-22 BOARD, COMPLETE	
		***********************	
	*1-556-934-00	CABLE, PIN	
	*3-662-227-00	HOLDER (R-3), LED	
	*3-662-383-00	BAND, RETAINER, TUNER	
	*3-674-390-00	HOLDER (B), LED	
	*3-687-523-01	LID, UPPER, SHIELD CASE, TU	
	*3-687-524-01	LID, BOTTOM, SHIELD CAES, TU	
	*3-687-525-01	CASE (MAIN), SHIELD, TU	
	*3-687-550-01	CASE (UPPER LID), SHIELD, AU	
	*3-687-558-01	CASE (MAIN), SHIELD, AU	
	*3-687-559-01	CASE (BOTTOM LID), SHIELD, AU	
	*4-336-029-00	PLATE, SHIELD	

CAPACITOR

No.	Part No.	Description			Remark
C001	1-102-530-00	CERAMIC	120PF	5%	50V
C002	1-102-529-00	CERAMIC	100PF	5%	50V
C003	1-102-508-00	CERAMIC	10PF	0.5PF	50V
C004	1-102-523-00	CERAMIC	56PF	5%	50V
C006	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C007	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C008	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C009	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C010	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C011	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C012	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C013	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C014	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C015	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C016	1-123-369-00	ELECT	4.7MF	20%	25V
C018	1-123-356-00	ELECT	10MF	20%	16V
C019	1-161-013-00	CERAMIC	0.01MF	20%	25V
C020	1-123-356-00	ELECT	10MF	20%	16V
C021	1-102-129-00	CERAMIC	0.01MF	10%	50V
C022	1-102-529-00	CERAMIC	100PF	5%	50V
C023	1-102-518-00	CERAMIC	33PF	5%	50V
C024	1-102-504-00	CERAMIC	4PF	0.25PF	50V
C025	1-102-504-00	CERAMIC	4PF	0.25PF	50V
C026	1-102-518-00	CERAMIC	33PF	5%	50V
C027	1-102-529-00	CERAMIC	100PF	5%	50V
C028	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C029	1-123-356-00	ELECT	10MF	20%	16V
C030	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C031	1-123-379-00	ELECT	0.47MF	20%	50V
C032	1-101-004-00	CERAMIC	0.01MF		50V
C033	1-101-004-00	CERAMIC	0.01MF		50V
C034	1-123-318-00	ELECT	33MF	20%	16V
C035	1-102-978-00	CERAMIC	220PF	5%	50V
C036	1-102-959-00	CERAMIC	22PF	5%	50V
C037	1-102-959-00	CERAMIC	22PF	5%	50V
C038	1-101-004-00	CERAMIC	0.01MF		50V
C039	1-101-004-00	CERAMIC	0.01MF		50V
C040	1-161-030-00	CERAMIC	0.0047MF	20%	25V
C041	1-161-013-00	CERAMIC	0.01MF	20%	25V
C042	1-102-959-00	CERAMIC	22PF	5%	50V
C043	1-101-004-00	CERAMIC	0.01MF		50V
C044	1-123-318-00	ELECT	33MF	20%	16V
C045	1-123-321-00	ELECT	220MF	20%	16V
C050	1-123-356-00	ELECT	10MF	20%	50V
C051	1-123-356-00	ELECT	10MF	20%	50V
C052	1-123-356-00	ELECT	10MF	20%	16V
C053	1-123-356-00	ELECT	10MF	20%	50V
C054	1-102-973-00	CERAMIC	100PF	5%	50V
C055	1-130-495-00	MYLAR	0.1MF	5%	50V
C056	1-130-493-00	MYLAR	0.068MF	5%	50V
C057	1-130-493-00	MYLAR	0.068MF	5%	50V
C058	1-102-963-00	CERAMIC	33PF	5%	50V
C059	1-123-380-00	ELECT	1MF	20%	50V
C060	1-123-381-00	ELECT	2.2MF	20%	50V
C061	1-102-518-00	CERAMIC	33PF	5%	50V
C062	1-102-518-00	CERAMIC	33PF	5%	50V
C063	1-101-004-00	CERAMIC	0.01MF		50V
C064	1-101-004-00	CERAMIC	0.01MF		50V
C065	1-102-125-00	CERAMIC	0.0047MF	10%	50V
C066	1-101-004-00	CERAMIC	0.01MF		50V
C067	1-101-006-00	CERAMIC	0.047MF		50V
C068	1-101-006-00	CERAMIC	0.047MF		50V
C301	1-123-356-00	ELECT	10MF	20%	16V
C302	1-123-321-00	ELECT	220MF	20%	16V
C303	1-123-321-00	ELECT	220MF	20%	16V
C304	1-123-356-00	ELECT	10MF	20%	16V
C305	1-123-356-00	ELECT	10MF	20%	16V
C306	1-130-487-00	MYLAR	0.022MF	5%	50V
C307	1-123-380-00	ELECT	1MF	20%	50V
C308	1-123-380-00	ELECT	1MF	20%	50V
C309	1-123-318-00	ELECT	33MF	20%	16V
C310	1-123-306-00	ELECT	47MF	20%	6.3V
C311	1-130-491-00	MYLAR	0.047MF	5%	50V
C312	1-130-483-00	MYLAR	0.01MF	5%	50V
C313	1-123-318-00	ELECT	33MF	20%	16V
C314	1-123-318-00	ELECT	33MF	20%	16V
C315	1-123-380-00	ELECT	1MF	20%	50V
C316	1-130-471-00	MYLAR	0.001MF	5%	50V
C317	1-123-380-00	ELECT	1MF	20%	50V
C318	1-102-111-00	CERAMIC	270PF	10%	50V
C319	1-130-485-00	MYLAR	0.015MF	5%	50V
C320	1-123-380-00	ELECT	1MF	20%	50V
C321	1-123-369-00	ELECT	4.7MF	20%	25V
C323	1-123-607-00	ELECT	0.1MF	20%	50V
C331	1-123-332-00	ELECT	47MF	20%	16V
C332	1-161-013-00	CERAMIC	0.01MF	10%	25V
C333	1-161-055-00	CERAMIC	0.022MF	10%	25V
C334	1-107-166-00	MICA	62PF	5%	500V
C335	1-129-712-00	FILM	0.0068MF	10%	630V

When indicating parts by reference number, please include the board name.

No.	Part No.	Description	Remark
		CERAMIC DISCRIMINATOR	
CD001	1-404-380-00	DISCRIMINATOR, CERAMIC 5.5MHZ	
		FILTER	
CF001	1-527-263-00	CERAMIC FILTER (5.5MHZ)	
		CONNECTOR	
CN001	*1-560-893-00	PIN, CONNECTOR 5P	
CN002	*1-560-893-00	PIN, CONNECTOR 5P	
CN003	*1-560-900-00	PIN, CONNECTOR 12P	
CN301	*1-508-797-00	PIN, CONNECTOR 4P	
CN302	*1-560-893-00	PIN, CONNECTOR 5P	
CN303	*1-508-743-00	PIN, CONNECTOR 5P	
		TRIMMER	
CT001	1-404-134-00	TRAP, CERAMIC (5.5MHZ)	
		OSCILLATOR	
CX001	1-527-822-00	OSCILLATOR, CERAMIC	
		DIODE	
D001	8-719-812-31	DIODE TLR123	
D002	8-719-812-32	DIODE TLY123	
D003	8-719-812-33	DIODE TLG123A	
D004	8-719-911-19	DIODE 1SS119	
D010	8-719-812-31	DIODE TLR123	
D011	8-719-812-31	DIODE TLR123	
D013	8-719-911-19	DIODE 1SS119	
D301	8-719-911-19	DIODE 1SS119	
D302	8-719-911-19	DIODE 1SS119	
D303	8-719-000-12	DIODE MC931	
D304	8-719-911-19	DIODE 1SS119	
		IC	
IC001	8-759-276-07	IC TA7607AP	
IC002	8-759-193-91	IC UPC1391H	
IC003	8-759-800-12	IC LA7920	
IC004	8-759-157-40	IC UPC574J	
IC005	8-759-602-05	IC M50160-019SP	
IC006	8-759-600-66	IC M58653P	
IC301	8-752-006-10	IC CX20061	
IC302	8-759-101-73	IC UPC1513HA	
IC303	8-759-911-23	IC BA5115	
		COIL	
L001	1-408-591-00	MICRO INDUCTOR 1UH	
L002	1-408-600-00	MICRO INDUCTOR 5.6UH	
L003	1-408-600-00	MICRO INDUCTOR 5.6UH	
L004	1-408-615-00	MICRO INDUCTOR 100UH	
L005	1-408-603-00	MICRO INDUCTOR 10UH	
L006	1-408-599-00	MICRO INDUCTOR 4.7UH	
L007	1-408-606-00	MICRO INDUCTOR 18UH	
L008	1-408-607-00	MICRO INDUCTOR 22UH	
L301	1-407-963-00	MICRO INDUCTOR 15MMH	
L302	1-408-221-00	MICRO INDUCTOR 22MMH	
L331	1-407-710-00	MICRO INDUCTOR 270UH	
		IC LINK	
PS001⚠	1-532-637-00	LINK, IC 1.0A	
		TRANSISTOR	
Q001	8-729-203-28	TRANSISTOR 2SC2216	
Q002	8-729-245-83	TRANSISTOR 2SC2458	
Q003	8-729-245-83	TRANSISTOR 2SC2458	
Q004	8-729-113-32	TRANSISTOR 2SB733	
Q005	8-729-603-50	TRANSISTOR 2SC403SP	
Q006	8-729-245-83	TRANSISTOR 2SC2458	
Q007	8-729-245-83	TRANSISTOR 2SC2458	
Q008	8-729-204-83	TRANSISTOR 2SA1048-GR	
Q301 ⚠	8-729-178-54	TRANSISTOR 2SC2785	
Q302	8-729-245-83	TRANSISTOR 2SC2458	
Q303	8-729-245-83	TRANSISTOR 2SC2458	
Q331	8-729-173-37	TRANSISTOR 2SA733-P	
Q332	8-729-967-32	TRANSISTOR 2SC2673	
		RESISTOR	
R001	1-247-847-00	CARBON 4.7K 5% 1/6W	
R002	1-247-839-00	CARBON 2.2K 5% 1/6W	
R003	1-247-815-00	CARBON 220 5% 1/6W	
R004	1-247-813-00	CARBON 180 5% 1/6W	
R005	1-247-819-00	CARBON 330 5% 1/6W	
R006	1-247-837-00	CARBON 1.8K 5% 1/6W	
R007	1-247-835-00	CARBON 1.5K 5% 1/6W	
R008	1-247-839-00	CARBON 2.2K 5% 1/6W	
R009	1-247-877-00	CARBON 82K 5% 1/6W	
R010	1-247-867-00	CARBON 33K 5% 1/6W	
R011	1-247-879-00	CARBON 100K 5% 1/6W	
R012	1-247-879-00	CARBON 100K 5% 1/6W	
R013	1-247-901-00	CARBON 820K 5% 1/6W	
R014	1-247-863-00	CARBON 22K 5% 1/6W	
R015	1-247-855-00	CARBON 10K 5% 1/6W	
R016	1-247-829-00	CARBON 820 5% 1/6W	
R018	1-247-831-00	CARBON 1K 5% 1/6W	
R019	1-247-813-00	CARBON 180 5% 1/6W	
R020	1-247-807-00	CARBON 100 5% 1/6W	
R021	1-247-831-00	CARBON 1K 5% 1/6W	
R022	1-247-829-00	CARBON 820 5% 1/6W	
R024	1-247-831-00	CARBON 1K 5% 1/6W	
R025	1-247-831-00	CARBON 1K 5% 1/6W	
R026	1-247-817-00	CARBON 270 5% 1/6W	
R027	1-247-847-00	CARBON 4.7K 5% 1/6W	
R028	1-247-821-00	CARBON 390 5% 1/6W	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

No.	Part No.	Description				Remark
R032 ⚠.	1-213-146-00	METAL OXIDE	1.8K	5%	1W	F
R033	1-247-851-00	CARBON	6.8K	5%	1/6W	
R034	1-247-865-00	CARBON	27K	5%	1/6W	
R035	1-247-855-00	CARBON	10K	5%	1/6W	
R036	1-247-879-00	CARBON	100K	5%	1/6W	
R038	1-247-839-00	CARBON	2.2K	5%	1/6W	
R039	1-247-835-00	CARBON	1.5K	5%	1/6W	
R040	1-247-833-00	CARBON	1.2K	5%	1/6W	
R042 ⚠.	1-213-146-00	METAL OXIDE	1.8K	5%	1W	F
R043	1-247-863-00	CARBON	22K	5%	1/6W	
R044	1-247-863-00	CARBON	22K	5%	1/6W	
R045	1-247-863-00	CARBON	22K	5%	1/6W	
R046	1-247-863-00	CARBON	22K	5%	1/6W	
R047	1-247-863-00	CARBON	22K	5%	1/6W	
R048	1-247-891-00	CARBON	330K	5%	1/6W	
R049	1-247-839-00	CARBON	2.2K	5%	1/6W	
R050	1-247-851-00	CARBON	6.8K	5%	1/6W	
R051	1-247-843-00	CARBON	3.3K	5%	1/6W	
R052	1-247-815-00	CARBON	220	5%	1/6W	
R055	1-247-863-00	CARBON	22K	5%	1/6W	
R059	1-247-863-00	CARBON	22K	5%	1/6W	
R060	1-247-863-00	CARBON	22K	5%	1/6W	
R061	1-247-863-00	CARBON	22K	5%	1/6W	
R062	1-247-863-00	CARBON	22K	5%	1/6W	
R063	1-247-831-00	CARBON	1K	5%	1/6W	
R064	1-247-831-00	CARBON	1K	5%	1/6W	
R068	1-247-847-00	CARBON	4.7K	5%	1/6W	
R069	1-247-863-00	CARBON	22K	5%	1/6W	
R070	1-247-855-00	CARBON	10K	5%	1/6W	
R071	1-247-855-00	CARBON	10K	5%	1/6W	
R073	1-247-853-00	CARBON	8.2K	5%	1/6W	
R074	1-247-847-00	CARBON	4.7K	5%	1/6W	
R302	1-247-879-00	CARBON	100K	5%	1/6W	
R303	1-247-833-00	CARBON	1.2K	5%	1/6W	
R304	1-247-839-00	CARBON	2.2K	5%	1/6W	
R305	1-247-875-00	CARBON	68K	5%	1/6W	
R306	1-247-837-00	CARBON	1.8K	5%	1/6W	
R308	1-247-871-00	CARBON	47K	5%	1/6W	
R310	1-247-843-00	CARBON	3.3K	5%	1/6W	
R311	1-247-855-00	CARBON	10K	5%	1/6W	
R312	1-247-871-00	CARBON	47K	5%	1/6W	
R313	1-247-855-00	CARBON	10K	5%	1/6W	
R314	1-247-875-00	CARBON	68K	5%	1/6W	
R315	1-210-825-00	SOLID	3.3M	5%	1/4W	
R316	1-247-883-00	CARBON	150K	5%	1/6W	
R317	1-247-863-00	CARBON	22K	5%	1/6W	
R318	1-247-875-00	CARBON	68K	5%	1/6W	
R319	1-247-859-00	CARBON	15K	5%	1/6W	
R320	1-247-891-00	CARBON	330K	5%	1/6W	
R321	1-247-827-00	CARBON	680	5%	1/6W	
R322	1-247-887-00	CARBON	220K	5%	1/6W	
R323	1-247-863-00	CARBON	22K	5%	1/6W	
R324	1-247-841-00	CARBON	2.7K	5%	1/6W	
R325	1-247-859-00	CARBON	15K	5%	1/6W	
R326	1-247-819-00	CARBON	330	5%	1/6W	
R327	1-247-871-00	CARBON	47K	5%	1/6W	
R328	1-247-783-00	CARBON	10	5%	1/6W	
R329	1-247-875-00	CARBON	68K	5%	1/6W	
R330 ⚠.	1-246-873-11	CARBON	22	5%	1/4W	F
R331	1-247-867-00	CARBON	33K	5%	1/6W	
R332	1-247-847-00	CARBON	4.7K	5%	1/6W	
R333	1-247-859-00	CARBON	15K	5%	1/6W	
R334 ⚠.	1-246-980-00	CARBON	3.3	5%	1/8W	F
R335	1-247-855-00	CARBON	10K	5%	1/6W	
R336	1-247-901-00	CARBON	820K	5%	1/6W	

VARIABLE RESISTOR

RV001	1-228-746-00	RES, ADJ, CARBON 2.2K
RV301	1-228-749-00	RES, ADJ, CARBON 22K
RV331	1-228-998-00	RES, ADJ, METAL GLAZE 220K

SWITCH

S001	1-553-997-00	SWITCH, KEY BOARD
S002	1-553-997-00	SWITCH, KEY BOARD
S003	1-553-997-00	SWITCH, KEY BOARD
S004	1-553-997-00	SWITCH, KEY BOARD
S005	1-553-997-00	SWITCH, KEY BOARD
S006	1-553-997-00	SWITCH, KEY BOARD
S007	1-553-997-00	SWITCH, KEY BOARD

FILTER

SF001	1-404-433-00	SAWF

TRANSFORMER

T001	1-404-476-00	COIL, IF
T002	1-404-476-00	COIL, IF
T003	1-404-428-00	VIFT
T004	1-404-427-00	VIFT
T005	1-404-427-00	VIFT
T331	1-433-275-00	TRANSFORMER, BIAS OSCILLATOR

****

*1-613-234-11 MT-10 BOARD
****

TUNER

TU001 ⚠.	1-463-350-12	TUNER, (BT-881)

****

*1-613-233-12 RD-21 BOARD
****

DIODE

PC101	8-719-913-41	DIODE SPI201-22

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

RD-21 RD-20 N PS-67

No.	Part No.	Description				Remark
		RESISTOR				
R101	1-247-815-00	CARBON	220	5%	1/6W	
R102	1-247-867-00	CARBON	33K	5%	1/6W	
R103	1-247-859-00	CARBON	15K	5%	1/6W	

****

*1-613-232-12 RD-20 BOARD
****

		DIODE				
PC001	8-719-913-41	DIODE SPI201-22				
		RESISTOR				
R001	1-247-815-00	CARBON	220	5%	1/6W	
R002	1-247-867-00	CARBON	33K	5%	1/6W	
R003	1-247-859-00	CARBON	15K	5%	1/6W	

****

*1-606-794-00 N BOARD
****

		CAPACITOR				
C001	1-123-617-00	ELECT	10MF	20%	16V	
C002	1-123-617-00	ELECT	10MF	20%	16V	
C003	1-123-617-00	ELECT	10MF	20%	16V	
C004	1-161-057-00	CERAMIC	0.033MF	10%	25V	
C005	1-106-184-00	MYLAR	0.0033MF	5%	50V	
C006	1-123-821-00	ELECT	47MF	20%	16V	
		DIODE				
D001	8-719-110-32	DIODE PH302B				
		IC				
IC001	8-759-102-84	IC UPC1373HA				
		COIL				
L001	1-404-310-00	COIL				

****

*A-6729-106-A PS-67 BOARD, COMPLETE
****

	1-533-162-00	HOLDER, FUSE				
		CAPACITOR				
C001	⚠.1-130-710-00	FILM	0.1MF	20%	250V	
C002	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C003	1-161-013-00	CERAMIC	0.01MF	10%	25V	
C004	1-124-362-00	ELECT	4700MF	20%	42V	
C005	1-123-375-00	ELECT	220MF	20%	63V	

No.	Part No.	Description				Remark
C006	1-123-357-00	ELECT	22MF	20%	50V	
C007	1-123-375-00	ELECT	220MF	20%	63V	
C008	1-123-357-00	ELECT	22MF	20%	50V	
C015	1-123-324-00	ELECT	1000MF	20%	16V	
		CONNECTOR				
CN001	*1-560-893-00	PIN, CONNECTOR 5P				
CN002	*1-560-894-00	PIN, CONNECTOR 6P				
CN003	*1-560-891-00	PIN, CONNECTOR 3P				
CN004	*1-560-891-00	PIN, CONNECTOR 3P				
CN005	*1-560-894-00	PIN, CONNECTOR 6P				
		DIODE				
D001	⚠.8-719-505-10	DIODE S5VB10				
D002	8-719-200-02	DIODE 10E2				
D003	8-719-101-31	DIODE RD39E-C3				
D004	8-719-200-02	DIODE 10E2				
D005	8-719-101-31	DIODE RD39E-C3				
D006	8-719-100-42	DIODE RD6.8E-B3				
D007	8-719-100-42	DIODE RD6.8E-B3				
D008	8-719-100-41	DIODE RD6.8E-B2				
D009	8-719-200-02	DIODE 10E2				
		FUSE				
F001	⚠.1-532-285-11	FUSE, TEME-LAG T1.25A 250V				
F002	⚠.1-532-350-11	FUSE, TEME-LAG T4A 250V				
		IC LINK				
PS001	⚠.1-532-679-00	LINK, IC 0.6A				
		TRANSISTOR				
Q001	8-729-177-43	TRANSISTOR 2SD774				
Q002	8-729-113-33	TRANSISTOR 2SB733-4				
Q003	8-729-103-33	TRANSISTOR 2SD1310				
Q004	8-729-204-83	TRANSISTOR 2SA1048-GR				
Q005	8-729-177-23	TRANSISTOR 2SB772				
Q006	8-729-177-23	TRANSISTOR 2SB772				
Q007	8-729-900-36	TRANSISTOR DTC124ES				
Q008	8-729-900-36	TRANSISTOR DTC124ES				
		RESISTOR				
R001	1-247-143-00	CARBON	3.3K	5%	1/4W	
R002	1-247-143-00	CARBON	3.3K	5%	1/4W	
R004	1-244-822-51	CARBON	7.5	5%	1/2W	
R005	⚠.1-212-954-11	FUSIBLE	6.8	5%	1/2W	F
R006	1-246-481-00	CARBON	2.2K	5%	1/4W	
R007	1-247-147-00	CARBON	4.7K	5%	1/4W	
R008	1-247-133-00	CARBON	1.2K	5%	1/4W	
R009	1-247-133-00	CARBON	1.2K	5%	1/4W	
R010	1-247-133-00	CARBON	1.2K	5%	1/4W	
R011	1-247-133-00	CARBON	1.2K	5%	1/4W	
R012	1-247-855-00	CARBON	10K	5%	1/6W	
R013	1-247-155-00	CARBON	10K	5%	1/4W	

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

No.	Part No.	Description	Remark
R014	⚠.1-213-143-00	METAL OXIDE 1K 5% 1W	F

****

*1-614-195-11 PS-76 BOARD
****

CAPACITOR

C009	1-161-025-00	CERAMIC 0.1MF 10% 25V	
C010	1-123-346-00	ELECT 220MF 20% 35V	
C011	1-123-330-00	ELECT 22MF 20% 16V	
C012	1-123-850-00	ELECT 1000MF 20% 16V	
C013	1-123-323-00	ELECT 470MF 20% 16V	
C014	1-123-333-00	ELECT 100MF 20% 16V	

CONNECTOR

CN006	*1-560-895-00	PIN, CONNECTOR 7P	

FERRITE BEAD

FB001	1-543-236-11	BEAD, FERRITE	

IC

IC001	8-749-972-17	IC STK7217	

COIL

L002	1-421-701-11	COIL, CHOKE 150UH	
L003	1-408-944-00	COIL, CHOKE	
L004	1-408-944-00	COIL, CHOKE	

RESISTOR

R003	1-247-101-00	CARBON 56 5% 1/4W	

****

*1-614-196-11 VS-4 BOARD
****

SWITCH

S001	⚠.1-553-011-00	SWITCH, POWER VOLTAGE SELECTION	

****

*1-605-071-00 LM-8 BOARD
****

CAPACITOR

C101	1-161-057-00	CERAMIC 0.033MF 10% 50V	
C102	1-161-057-00	CERAMIC 0.033MF 10% 50V	

COIL

L101	1-408-120-00	MICRO INDUCTOR 18UH	
L102	1-408-120-00	MICRO INDUCTOR 18UH	

MISCELLANEOUS

No.	Part No.	Description	Remark
	A-6761-075-A	ACE ASSY	
	⚠.1-464-386-21	BOOSTER MIXER, RF MODULATOR (RFU-819)	
	⚠.1-551-908-11	CORD, POWER	
	8-825-508-10	HEAD, FE (FULL ERASE HEAD)	
L901	1-464-330-11	SENSOR, S COIL	
L902	1-464-329-11	SENSOR, T COIL	
M902	8-838-080-01	MOTOR, DC (BHF-1908B) (CAPSTAN MOTOR)	
M903	*A-4910-049-A	R STATOR (REEL MOTOR) BOARD, COMPLETE	
M904	X-3679-268-1	MOTOR ASSY, L (LOADING/THREADING)	
PM901	⚠.1-454-349-41	SOLENOID, PLUNGER (PINCH)	
PM902	⚠.1-454-371-31	SOLENOID, PLUNGER (BRAKE)	
S901	1-554-839-11	SWITCH, LEAF (2 GANG)	
S903	1-554-840-11	SWITCH, LEAF (THREADING END)	
S904	1-554-840-11	SWITCH, LEAF (CASSETTE ON)	
T901	⚠.1-447-985-11	TRANSFORMER, POWER	

****

ACCESSORIES AND PACKING MATERIALS
****

Part No.	Description	Remark
A-6765-648-A	COMMANDER ASSY RMT-234/GOLD	
A-6765-649-A	COMMANDER ASSY RMT-234/RED	
A-6765-650-A	COMMANDER ASSY RMT-234/GRAY	
1-556-893-00	CORD ASSY, COAXIAL	
3-656-301-00	SCREWDRIVER, CONTROL	
*3-677-503-00	SHEET, PROTECTION	
3-681-287-01	LID, ACCESSORY CASE	
3-683-463-01	CASE, ACCESSORY	
*3-687-580-01	CUSHION (UPPER)	
*3-687-581-01	CUSHION (LOWER)	
*3-687-591-01	INDIVIDUAL CARTON (GRAY MODEL)	
*3-687-591-11	INDIVIDUAL CARTON (RED MODEL)	
*3-687-591-21	INDIVIDUAL CARTON (SILVER MODEL)	
*3-688-408-01	COVER, DUST	
3-760-103-91	MANUAL, INSTRUCTION (ENGLISH, ARABIC)	

****

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

SECTION 7
ADJUSTMENT

TABLE OF CONTENS

Section *Title* *Page*

1. PREPARATION FOR MECHANICAL SECTION CHECK, ADJUSTMENT AND REPLACEMENT

1-1. Disassembly of Cabinet 113
1-2. Removal of the RP-20 Board 114
1-3. Removal of the TA-22 Board 115
1-4. Removal of the YC-31 Board 115
1-5. Removal of the Power Block 116
1-6. Operation of the Unit With the FL Cassette Compartment Removed
  1-6-1. How to put the Unit into Threading Completed Mode when the FL Cassette Compartment is Removed 117
  1-6-2. Playback Without Cassette Installed 117
  1-6-3. How to put in Recording Mode Without Cassette Installed 117
1-7. How to Load, Thread, Unload and Unthread With the Power Off 118
  1-7-1. Manual Loading and Unloading 118
  1-7-2. Manual Threading and Unthreading 118
1-8. Tools and Fixtures Required For Servicing 119

2. PERIODIC CHECK AND MAINTENANCE

2-1. Post-Repair Maintenance
  2-1-1. Cleaning of Rotating Head Disk Assembly 120
  2-1-2. Cleaning of the Tape Movement System . . . 120
  2-1-3. Cleaning the Drive System 120
2-2. Periodic Check Items 121

3. CHECK, ADJUSTMENT AND REPLACEMENT PROCEDURES

3-1. Replacement of Rotating Head Disk Assembly
  3-1-1. Removal of the Rotating Head Disk Assembly 122
  3-1-2. Mounting of the Rotating Head Disk Assembly 122
3-2. Video Head Dihedral Check and Adjustment 123
3-3. Replacement and Adjustment of the Drum Assembly
  3-3-1. Replacement of the Drum Assembly 124
  3-3-2. Adjustment of the Motor Gap when Replacing the Drum Assembly 125
3-4. Replacement of the Capstan Motor
  3-4-1. Removal of the Capstan Motor 125
3-5. Removal of the S Coil Sensor 126
3-6. Removal of the FL Cassette Compartment Assembly 126
3-7. Adjustment of the FL Cassette Compartment
  3-7-1. Adjustment of the Position of the Right Gear of the FL Cassette Compartment Assembly 127
  3-7-2. Cassette ON Switch Operation Check and Adjustment 127
  3-7-3. Checking and Adjustment of the Cassette Door Assembly 128
  3-7-4. Mounting the FL Cassette Compartment Assembly 128
3-8. Removal of the No. 2 and No. 3 Guides
  3-8-1. Removal of the No. 2 Guide 129
  3-8-2. Removal of the No. 3 Guide 129
3-9. Replacement and Adjustment of the S Threading Ring
  3-9-1. Preparation to Remove the S Threading Ring Removal of the ACE Assembly, FE Head and Threading Motor 130
  3-9-2. Removal of the S Threading Ring 132
  3-9-3. S Threading Ring Mounting and Position Adjustment 133
3-10. Pinch Snap-Fit Limiter Gap Check and Adjustment 134
3-11. Threading End Switch and T Coil Sensor
  3-11-1. Threading End Switch (TE Switch) Position Check and Adjustment 135
  3-11-2. T Coil Sensor Mounting and Operation Check 136
3-12. Removal and Adjustment of the Reel Block Assembly
  3-12-1. Removal of the Reel Block Assembly 137
  3-12-2. Adjustment of the Position of the Tension Regulating Lever 137
3-13. Adjustment of the Forward Back Tension 138
3-14. Adjustment of the Forward Torque 138

4. TAPE PATH ADJUSTMENT

4-1. Tracking Adjustment 139
  4-1-1. Preparation for Adjustment 140
  4-1-2. Entrance Side Adjustment 140
  4-1-3. Exit Side Adjustment 142
4-2. Adjustments After Replacement of the Ace Assembly
  4-2-1. Exit Side Tracking Adjustment 143
  4-2-2. CTL Head (ACE Assembly) Position Adjustment 144
  4-2-3. Audio Head (ACE Assembly) Azimuth Adjustment 145
  4-2-4. Audio Head (ACE Assembly) Height Adjustment 145
4-3. How to Inspect the Tape Traveling When Adjusting the Tape Path 146

5. ELECTRICAL ALIGNMENT

5-1. Power Supply Check (PS-67 Board) 149
5-2. System Control Check (SS-34 Board) 149
5-3. Servo System Alignment
  5-3-1. Drum Servo System Alignment 149
  5-3-2. Capstan Servo System Alignment. 150
5-4. PAL Video System Alignment. 152
  5-4-1. Playback System Alignment. 152
  5-4-2. Record System Alignment. 154
5-5. Audio System Adjustment (TA-22 Board). . . . 156
5-6. Tuner System Adjustment (TA-22 Board) 157
5-7. Timer System Adjustment (TM-57 Board). . . . 157
5-8. SECAM Video System Alignment 158

1. PREPARATION FOR MECHANICAL SECTION CHECK, ADJUSTMENT AND REPLACEMENT

1-1. DISASSEMBLY OF CABINET

1) Remove the four case set screws ❶ .
2) Remove the upper case ❷ in the direction shown by the arrow Ⓐ .
3) Loosen the eight screws (BVTP3 x 8) ❸ .
4) Remove the lower case ❹ in the direction shown by the arrow Ⓑ .
5) Remove the three screws (BVTP3 x 8) ❺ .
6) Remove the two claws ❻ in the direction shown by the arrow Ⓒ , then remove the front panel ❼ in the direction shown by the arrow Ⓓ .

Note: Follow the disassembly procedure in the numerical order given.

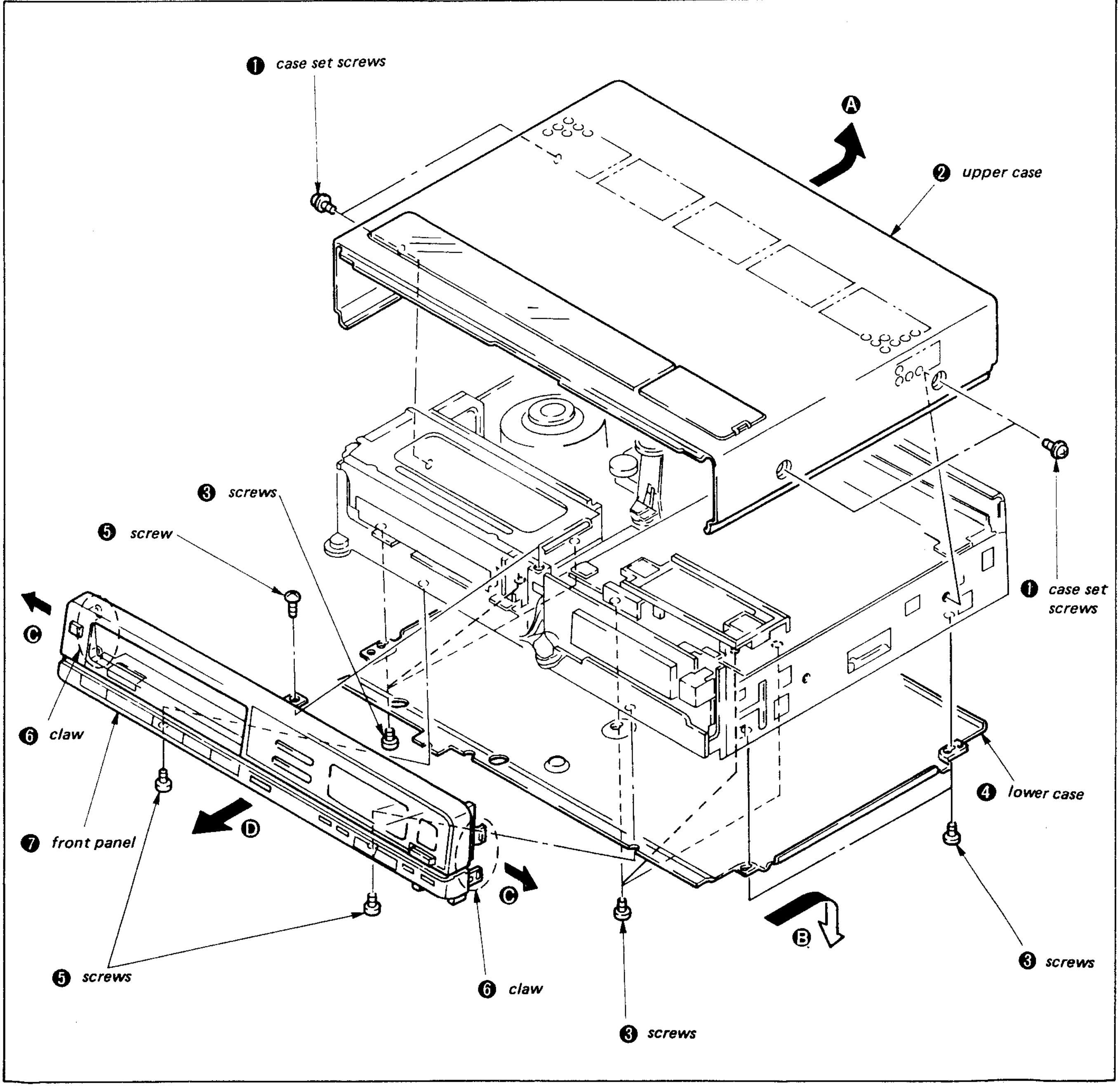

❶ case set screws
Ⓐ
❷ upper case
❸ screws
❺ screw
Ⓒ
❶ case set screws
❻ claw
❹ lower case
❼ front panel
Ⓓ
Ⓒ
Ⓑ
❸ screws
❺ screws
❻ claw
❸ screws

Fig. 1-1. Disassembly of Cabinet

1-2. REMOVAL OF THE RP-20 BOARD

1) Pull out the connector CN501 ❶ .
2) Remove the two screws (BVTP3 x 8) ❷ .
3) Pull out the three connectors (CN503, CN504) ❸ , ❹ .
4) Remove the two shield cases ❻ in the direction shown by the arrows Ⓐ and Ⓑ .

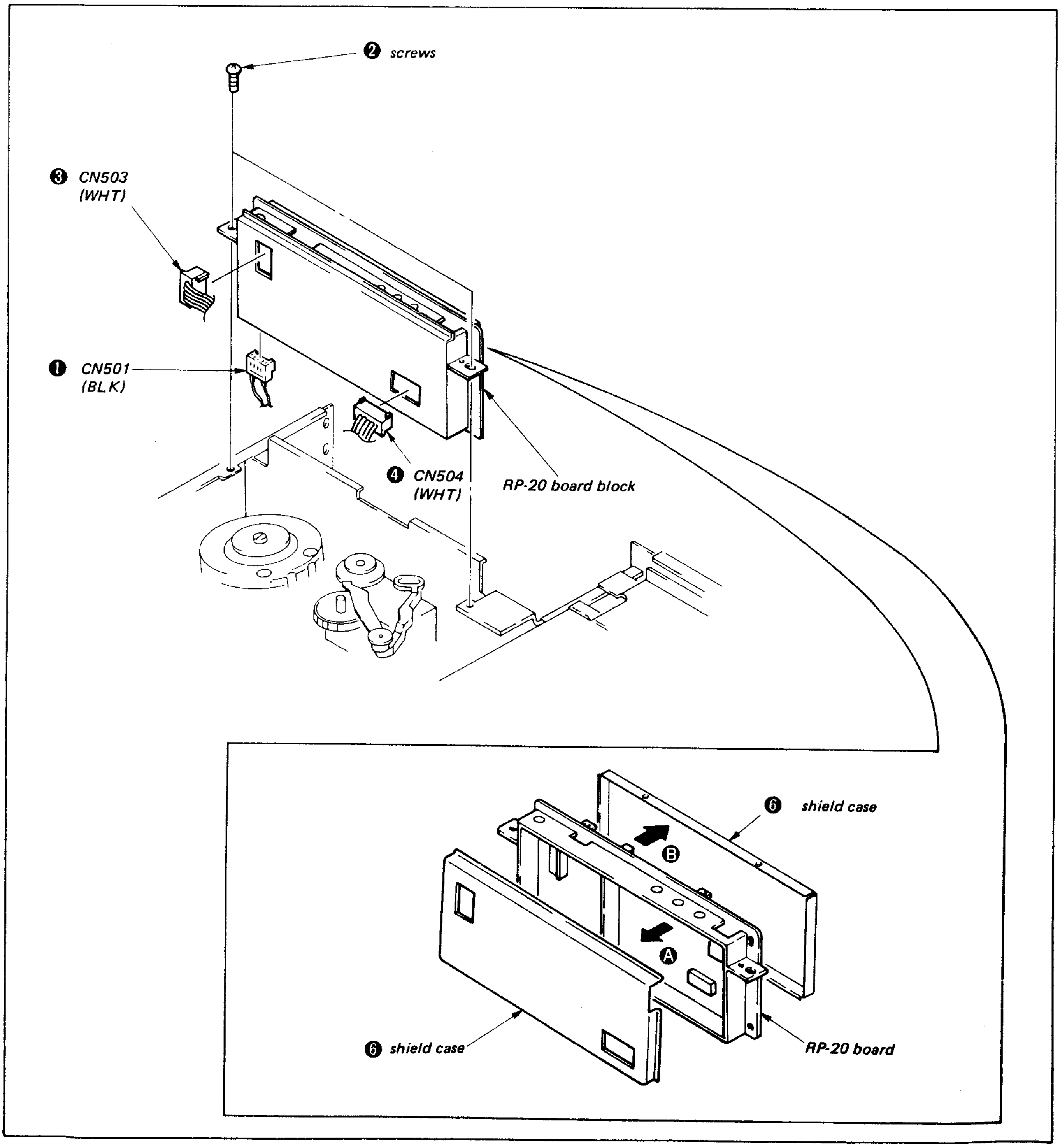

❷ screws
❸ CN503 (WHT)
❶ CN501 (BLK)
❹ CN504 (WHT)
RP-20 board block
❻ shield case
Ⓑ
Ⓐ
❻ shield case
RP-20 board

Fig. 1-2. Removal of the RP-20 Board

1-3. REMOVAL OF THE TA-22 BOARD

1) Remove the two screws (BVTP3 x 8) ❶.
2) Remove the TA-22 board ❷ in the direction shown by the arrow.

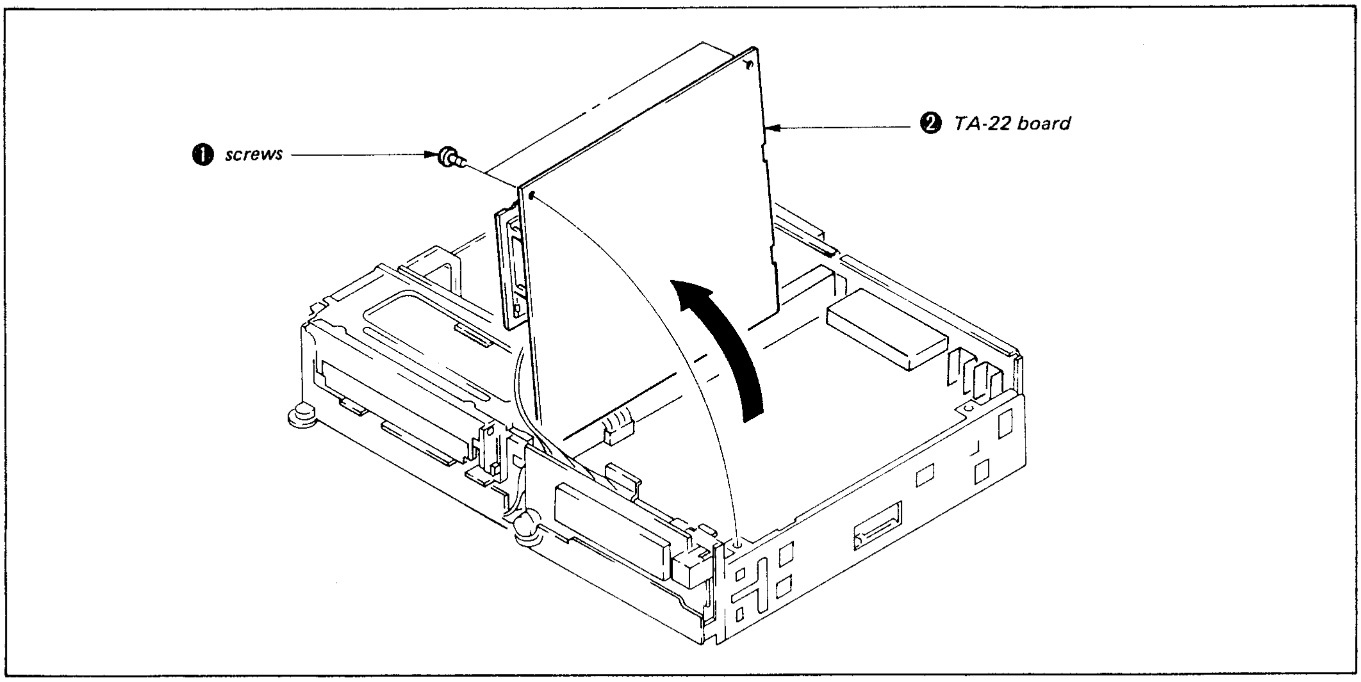

❶ screws
❷ TA-22 board

Fig. 1-3. Removal of the TA-22 Board

1-4. REMOVAL OF THE YC-31 BOARD

1) Stand the set with the left side panel on the bottom.
2) Remove the screw (BVTP3 x 8) ❶.
3) Remove the plate, connector ❷ in the direction shown by the arrow Ⓐ.
4) Remove the two screws (BVTP3 x 8) ❸.
5) Remove the YC-31 board ❹ in the direction shown by the arrow Ⓑ.

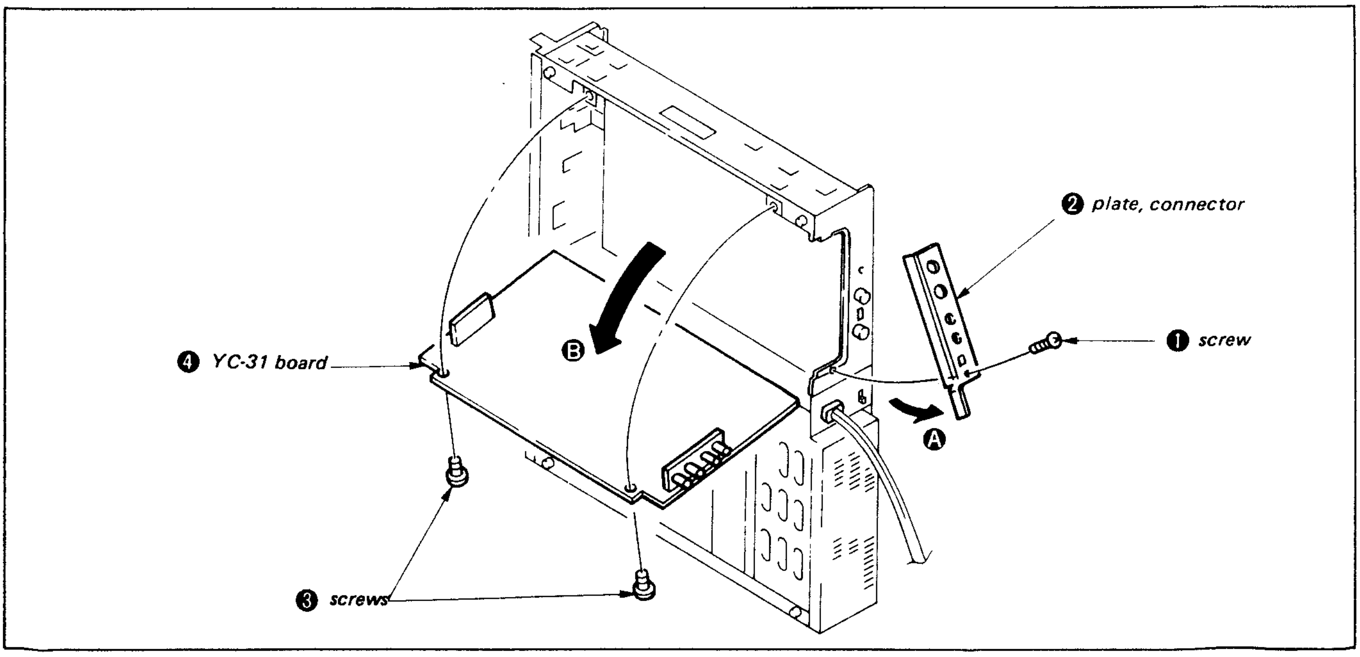

❷ plate, connector
❶ screw
❹ YC-31 board
Ⓑ
Ⓐ
❸ screws

Fig. 1-4. Removal of the YC-31 Board

1-5. REMOVAL OF THE POWER BLOCK

1) Remove the six screws (BVTP3 x 8) ❶.
2) Pull out the five connectors (CN001, CN002, CN003, CN004, CN005) ❷.
3) Remove the power block ❸ in the direction shown by the arrow.

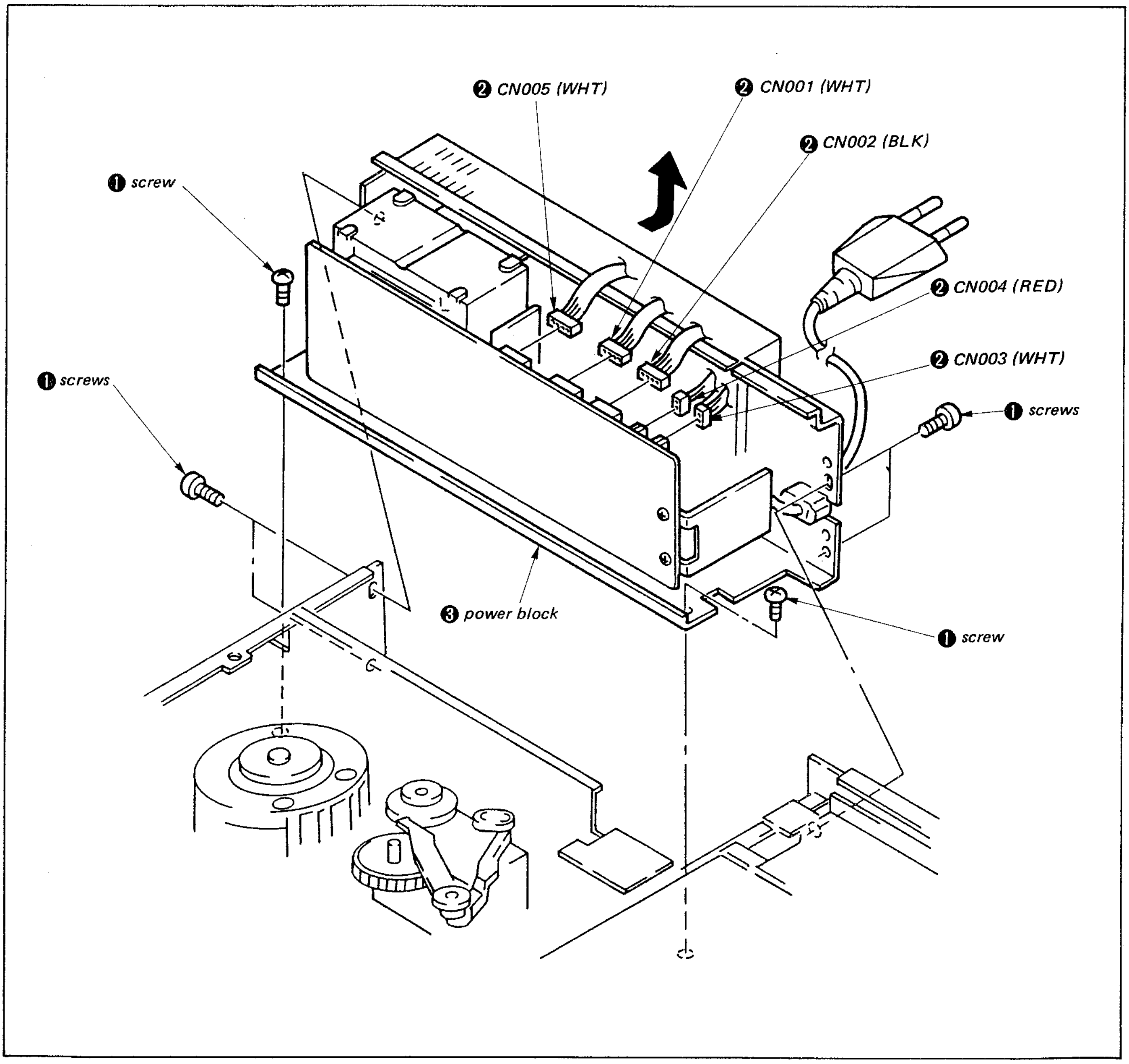

❷ CN005 (WHT)
❷ CN001 (WHT)
❷ CN002 (BLK)
❶ screw
❷ CN004 (RED)
❷ CN003 (WHT)
❶ screws
❶ screws
❸ power block
❶ screw

Fig. 1-5. Removal of the Power Block

1-6. OPERATION OF THE UNIT WITH THE FL CASSETTE COMPARTMENT REMOVED

1-6-1. How to Put the Unit into Threading Completed Mode when the FL Cassette Compartment is Removed

1) Connect ordinary screwdriver to short the leaf switch (cassette-on switch).

   Note:

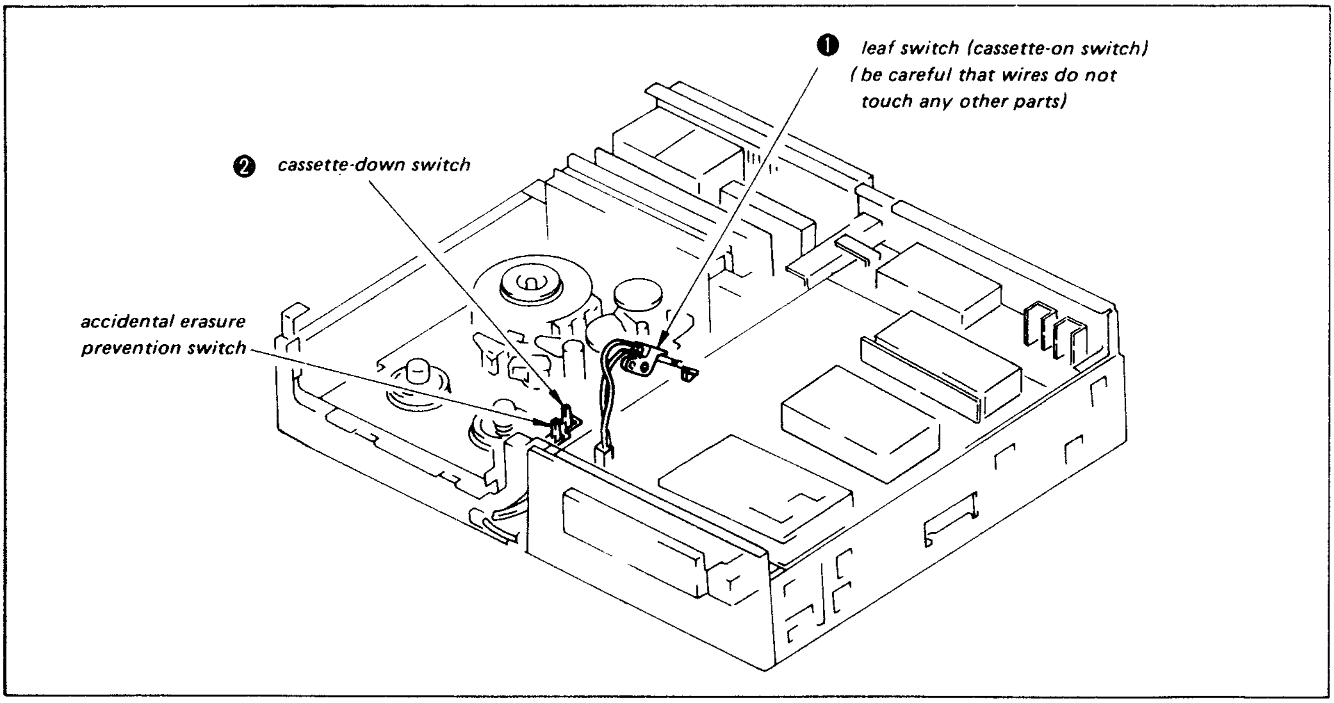
   Be careful that the ordinary screwdriver do not touch any other parts (use tape or other insulation).

2) Press the cassette-down switch and leave it pressed in. When the power button is turned ON, threading starts.

※ Refer to 3-6 for instructions on how to remove the FL cassette compartment.

[How to EJECT in this condition]

- Press the EJECT button. When unthreading is completed and the internal gear starts to turn, turn the power OFF.



❶ leaf switch (cassette-on switch) (be careful that wires do not touch any other parts)
❷ cassette-down switch
accidental erasure prevention switch

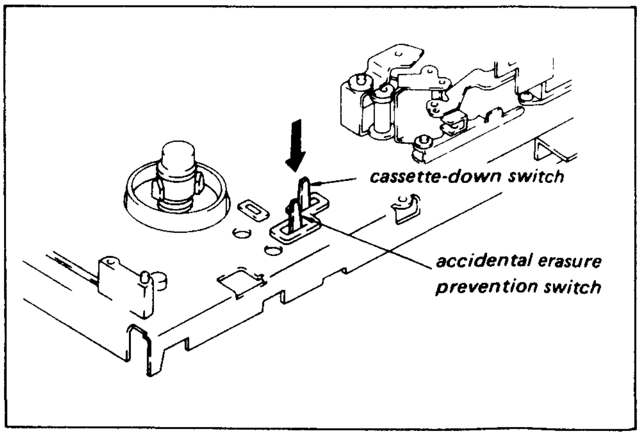
Fig. 1-6. How to thread the tape when the FL cassette compartment has been removed

1-6-2. Playback Without Cassette Installed

Complete threading by the procedure described in 1-6-1, then press the playback button.

1-6-3. How to Put in Recording Mode Without Cassette Installed

1. Thread by the procedure in 1-6-1 then ress the accidental erasure prevention switch shown in Fig. 1-7.
2. With the accidental erasure prevention switch pressed down, press the recording button.



cassette-down switch
accidental erasure prevention switch

Fig. 1-7. How to put the recorder in recording mode with the FL cassette compartment removed

1-7. HOW TO LOAD, THREAD, UNLOAD AND UNTHREAD WITH THE POWER OFF

1-7-1. Manual Loading and Unloading

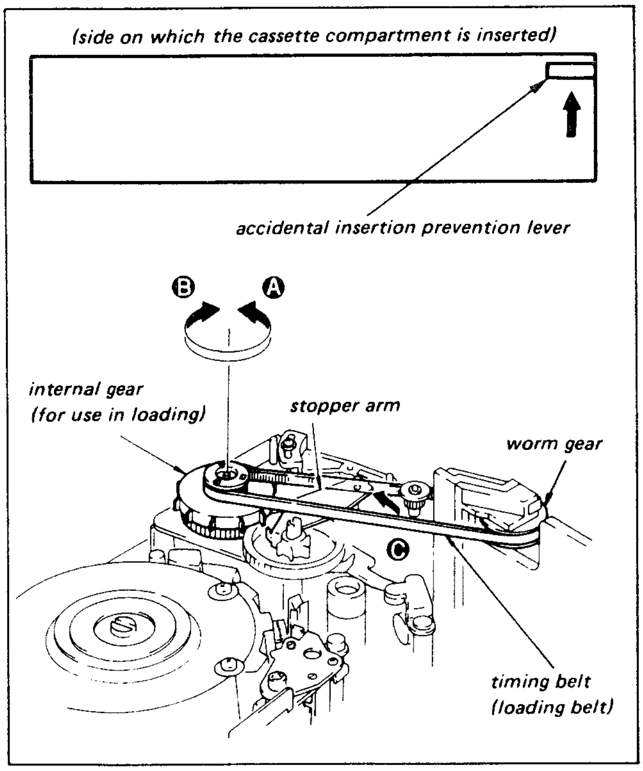

(side on which the cassette compartment is inserted)
accidental insertion prevention lever
Ⓑ
Ⓐ
internal gear
(for use in loading)
stopper arm
worm gear
Ⓒ
timing belt
(loading belt)

Fig. 1-8. Manual loading and unloading

1) Release the right accidental insertion prevention lever inside the cassette compartment, then press the stopper arm in the direction of arrow Ⓒ and release the internal gear stop.
2) Turn the internal gear manually in the direction of arrow Ⓐ until loading is completed.
3) To unload, turn the internal gear in the direction of arrow Ⓑ.

Note:

When the loading belt has been removed, load and unload by turning the worm gear manually.

1-7-2. Manual Threading and Unthreading

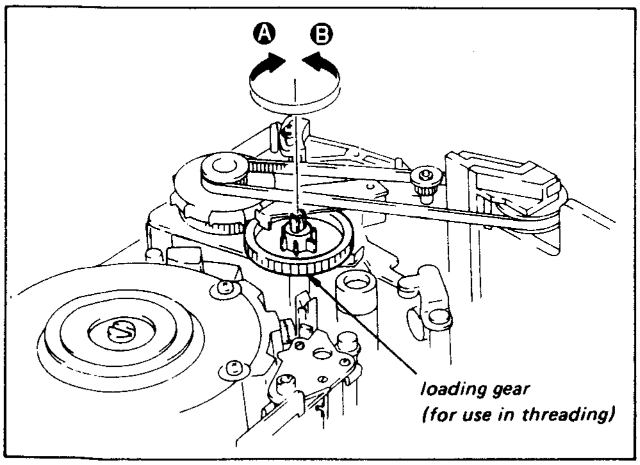

Ⓐ
Ⓑ
loading gear
(for use in threading)

Fig. 1-9. Manual threading and unthreading

1) Turn the loading gear in the direction of arrow Ⓐ until loading is completed.
2) To unthread, turn the loading gear in the direction of arrow Ⓑ.

Note:

Always turn the loading gear sideways by hand. Never use a screwdriver or other tool.

1-8. TOOLS AND FIXTURES REQUIRED FOR SERVICING

Ref.No.	Name	Part Code	Carved Jig No.	Use and Remarks
J-1	Torque Measurement Tape	J-6080-003-C	SL-0003C	forward torque and back tension measurement
J-2	Parallel Plate	J-6086-570-A	SL-0657	audio/CTL head lateral adjustment capstan shaft vertical adjustment
J-3	Dental Mirror (handle) Dental Mirror (mirror)	J-6080-029-A J 6080 030 1	SL-5052	tape path and tape traveling adjustment check
J-4	Alignment Tape (KR5-2H)	8-969-995-52	——	tracking, overall adjustment of picture quality, etc.
J-5	Cleaning Fluid	Y-2031-001-0	——	
J-6	Thickness Gauge	9-911-053-00		
J-7	Chamois Cloth	2-034-697-00	——	cleaning
J-8	Head Demagnetizer	widely available	——	demagnetization of video head and audio head
J-9	Cleaning Cassette Tape	8-888-004-00	——	video head cleaning
J-10	Dihedral Adjustment Screw	J-6080-013-A	SL-0013	video dihedral adjustment

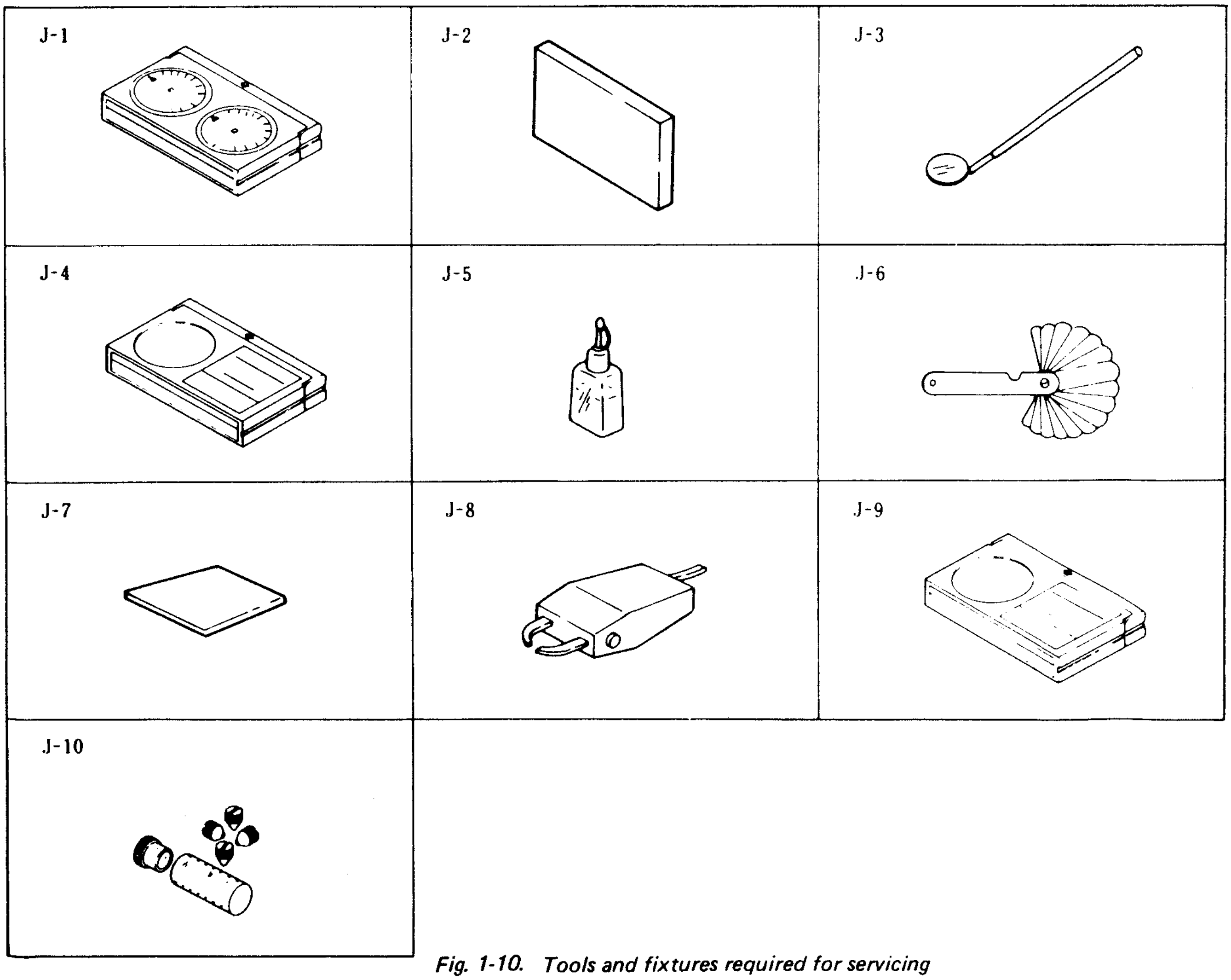


Fig. 1-10. Tools and fixtures required for servicing

2. PERIODIC CHECK AND MAINTENANCE

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

2-1. POST-REPAIR MAINTENANCE

The following must be done after every repair regardless of how many hours the user has operated the machine.

2-1-1. Cleaning of Rotating Head Disk Assembly

1) Press a chamois cloth (Jig Ref. No. J-7) which has been dipped in cleaning fluid (Jig Ref. No. J-5) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a right angle to the head tip. There is a very great danger of damaging the head tip if this is done.

2-1-2. Cleaning of the Tape Movement System

1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in in cleaning fluid.

2-1-3. Cleaning the Drive System

1) Clean the driving parts with a cloth that has been dipped in cleaning fluid.

parts requiring cleaning

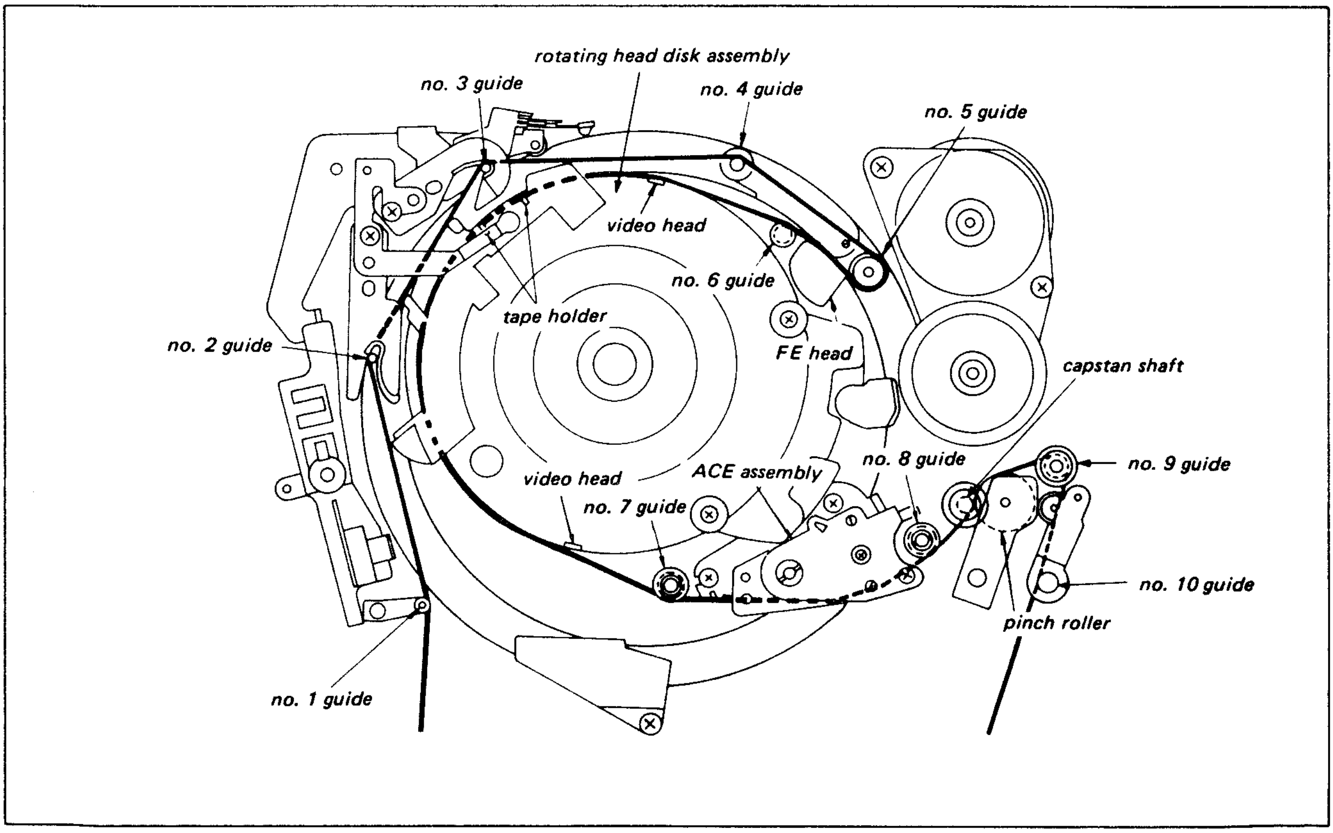

rotating head disk assembly
no. 3 guide
no. 4 guide
no. 5 guide
video head
no. 6 guide
tape holder
FE head
no. 2 guide
capstan shaft
no. 8 guide
no. 9 guide
video head
ACE assembly
no. 7 guide
no. 10 guide
pinch roller
no. 1 guide

Fig. 2-1. Parts requiring cleaning

2-2. PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below. accoring to user's operating hours.

			Operating Hours (H)										
Maintenance & Check		Replacement Part No.	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Trans-portation System	Cleaning of tape transportation system	——	○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning and degaussing of ACE ass'y	——	○	○	○	○	○	○	○	○	○	○	
	Cleaning & degaussing of video disk ass'y	——	○	○	○	○	○	○	○	○	○	○	The life of the head varies, depending on operational conditions and method.
Driving System	Loading belt (synchro belt)	3-684-264-01	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	This cleaning must be done whenever a repair is made.
	Cleaning of iron core and opening of solenoid	——	–	–	–	○	–	–	–	○	–	–	Wipe iron core and opening of solenoid with dry cloth.
Performance Confirmation	Abnormal sound		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which causes abnormal sound.
	Measurement of FWD back tension		–	☆	–	☆	–	☆	–	☆	–	☆	Confirmation must be made according to 3-13. Specified value: adjust to 31 – 35 g·cm (When measured with torque cassette tape)
	Confirmation of brake system		–	☆	–	☆	–	☆	–	☆	–	☆	
	Confirmation of record & playback functions		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 80 ± 5 g·cm (SL-0003C)

○ Cleaning ★ Replacement ☆ Confirmation

Note:

On overhaul

When overhauling the unit, replace parts as indicated in the above table.

3. CHECK, ADJUSTMENT AND REPLACEMENT PROCEDURES

3-1. REPLACEMENT OF ROTATING HEAD DISK ASSEMBLY

3-1-1. Removal of the Rotating Head Disk Assembly (Fig. 3-1)

1) Remove the two screws that hold the damper assembly in place, then remove the damper assembly.
2) Use a hexagonal wrench to remove the hexagonal socket bolt that holds the upper drum assembly in place, then remove the upper drum assembly.

   Note:

   Turn the upper drum to remove, being careful not to move the adjusting plate. Movement of the adjusting plate will have a great effect on the tape path, so caution is required.
3) Unsolder the rotating head disk relay plate (4 red and white leads).
4) Remove the two hexagonal socket bolts holding rotating head disk assembly ❺ in place, then remove the rotating head disk assembly.

   Note:

   Be careful not to touch the head tip with the hand or bang anything against it.

3-1-2. Mounting of the Rotating Head Disk Assembly (Fig. 3-1)

1) Insert rotating head disk ❺ in place, being careful of the direction so that the red and white leads are in the right places.
2) Tighten hexagonal socket bolt ❹ and solder the lead wires.

Note:

Be careful to solder the lead wires correctly and not to break any wires.

3) Attach the upper drum, being careful (as during removal) not to move the adjusting plate. While pressing the two points that determine the height, tighten hexagonal socket bolt ❷.

   Note:

   When inserting the upper drum, be careful that it does not touch the head tip.

Note:

When replacing the rotating drum head, it can happen that the rotating head disk assembly will be hard to remove. In such a case, remove it using the method explained below (Fig. 3-2).

1) Remove the hexagonal socket bolts that hold the rotating head disk assembly in place.
2) When the head disk is jammed on tight and is hard to remove, screw the hexagonal socket bolts removed in step ❶ into the threaded holes removed from the original holes by 90°. Tighten them a little at a time.

The head disk will be lifted up by the two screws and will come off easily.

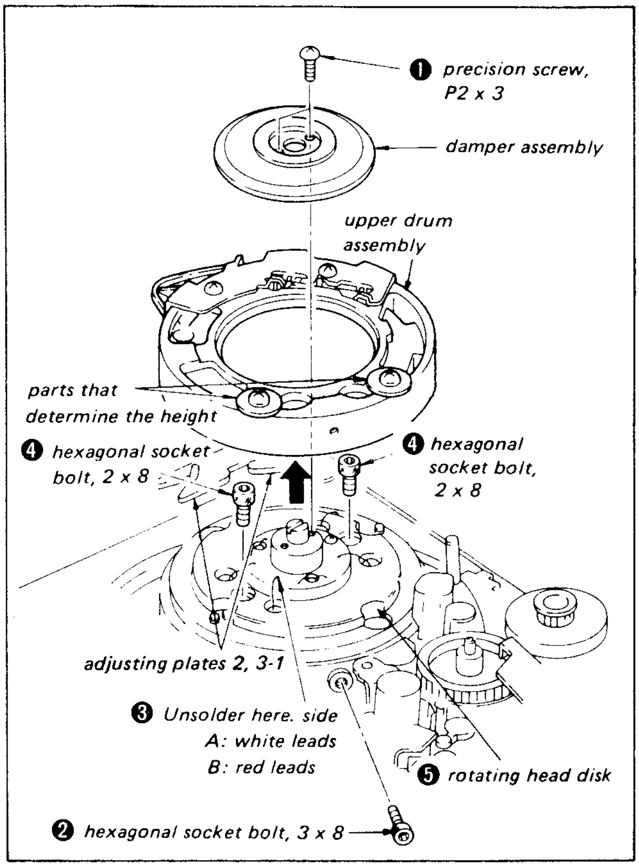

❶ precision screw, P2 x 3
damper assembly
upper drum assembly
parts that determine the height
❹ hexagonal socket bolt, 2 x 8
❹ hexagonal socket bolt, 2 x 8
adjusting plates 2, 3-1
❸ Unsolder here. side A: white leads B: red leads
❺ rotating head disk
❷ hexagonal socket bolt, 3 x 8

Fig. 3-1. Removal of the rotating head disk assembly I

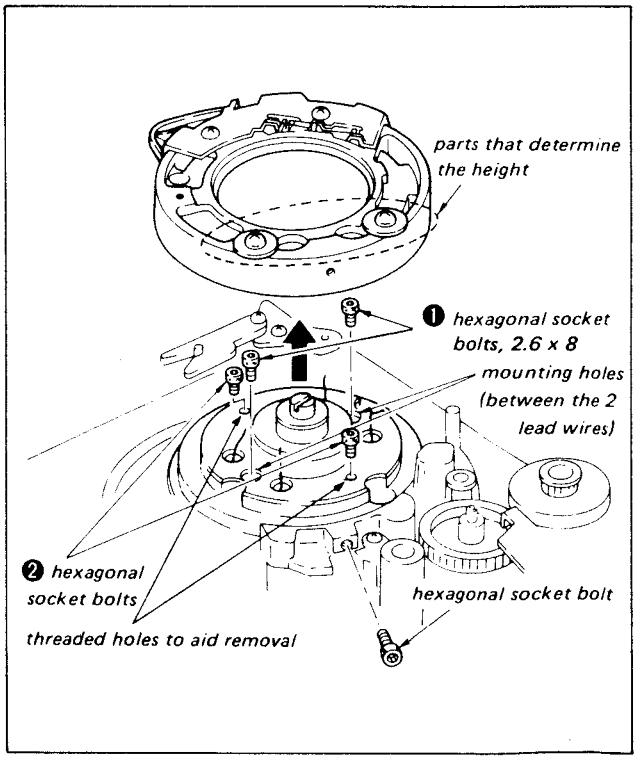

parts that determine the height
❶ hexagonal socket bolts, 2.6 x 8
mounting holes (between the 2 lead wires)
❷ hexagonal socket bolts
hexagonal socket bolt
threaded holes to aid removal

Fig. 3-2. Removal of the rotating head disk assembly II

3-2. VIDEO HEAD DIHEDRAL CHECK AND ADJUSTMENT

This adjustment is generally unnecessary, but it is sometimes necessary when the video head disk is replaced. (The video head disk used for maintenance has been precision adjusted at the factory using a microscope and almost never needs to be readjusted.)

When judging whether the video head dihedral angle is correct, the alignment tape is played back. When this is done the tracking control knob must be in the centering position. If the check is done with this knob in other than the center click position (if the tracking is off-center), even if the dihedral angle is correct the picture will be reproduced as if it were off.

Before this adjustment is performed, the ACE assembly position adjustment (refer to the section where the tape path adjustment is described) must be completed.

[Method of checking]

With the tracking control knob set to the center click position, play back the monoscope section of the alignment tape. Check to see if any of the vertical monoscope lines immediately below the switching pulse are reproduced double. If not, the dihedral angle is correct and does not have to be adjustment. If so, perform the adjustment as explained below.

[Method of adjustment]

1) As shown in Fig. 3-3, screw two dihedral angle adjustment screws (Jig Ref. No. J-10) into the adjustment screw holes on the side on which the red lead wires from the video head are connected, until the top of the screw is level with the video head disk. (If they are not screwed in far enough, the video head disk will not turn past the point where the top of the adjustment screw strikes the upper drum. Conversely, if it is screwed in too far, the head base will be moved, throwing the video head dihedral angle way off.)
   Note:
   The side on which the white lead wires are connected is the reference side and must not be moved.
2) Screw one of the two adjustment screws in a little bit farther until resistance is felt. Beyond this point, turning the screw still farther will move the video head, adjusing the dihedral angle.
3) With the adjustment screws in place, play the monoscope signal section of the alignment tape and see how the lines are reproduced. If the vertical lines are split apart more than before, turn the screw which was screwed in more tightly counterclockwise to loosen it, then adjust by tightening the other screw.
4) After the adjustment is completed, remove the adjustment screws and play the tape again to reconfirm that the adjustment is correct.

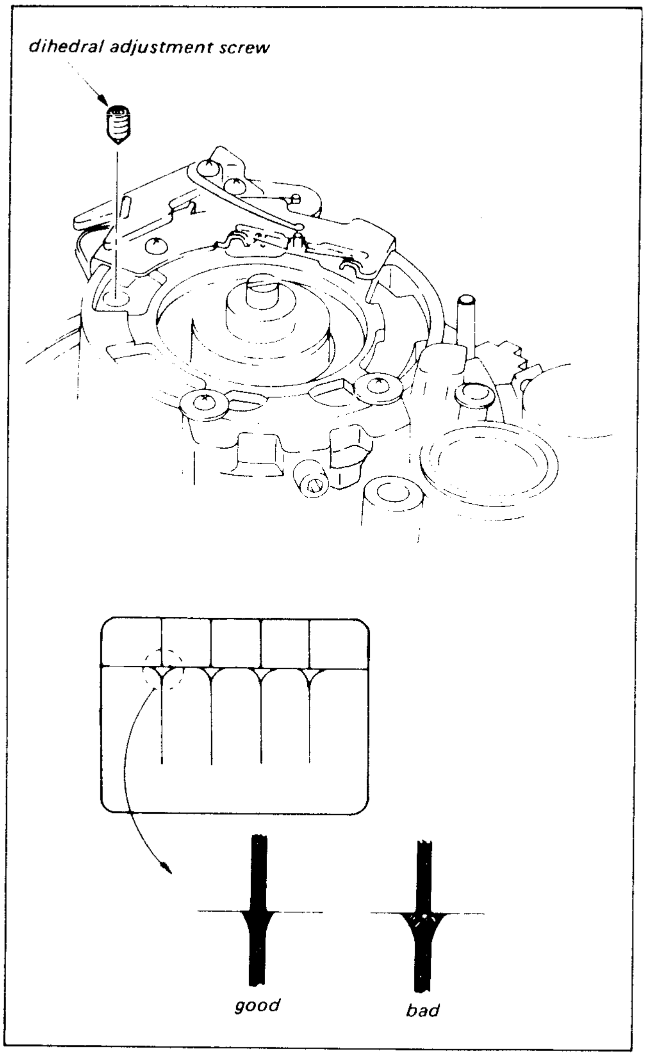


Fig. 3-3. Video head dihedral adjustment

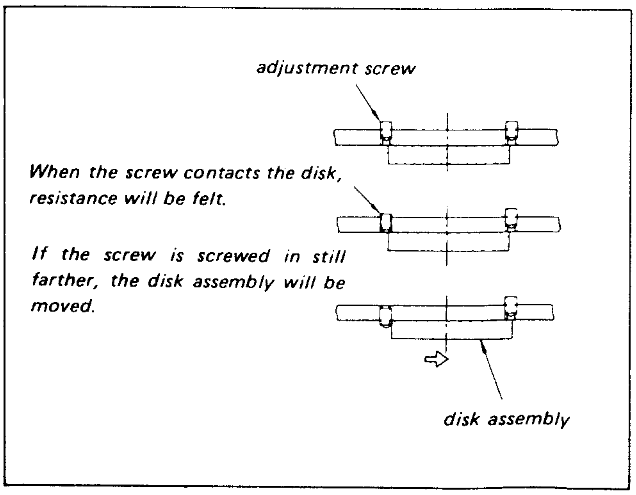

adjustment screw
When the screw contacts the disk, resistance will be felt.
If the screw is screwed in still farther, the disk assembly will be moved.
disk assembly

Fig. 3-4.

3-3. REPLACEMENT AND ADJUSTMENT OF THE DRUM ASSEMBLY

3-3-1. Replacement of the Drum Assembly

1) Measure gap Ⓐ between adjusting plate 2 and the upperdrum holder section and record the measurement.
   Note:
   The position where the adjusting plate is mounted has a large effect on the tape path, so this measurement must be performed.
2) Measure gap Ⓑ between adjusting plate 3-1 and the upper drum holder section, and record the measurement.
   Note:
   The position where the adjusting plate is mounted has a large effect on the tape path, so this measurement must be performed.
3) Remove the screws shown in Fig. 3-5, then remove the tape guide ground plate and adjusting plates 2 and 3-1.
4) Remove the 3 connectors from the rear of the chassis as shown in Fig. 3-6.
5) Remove the 3 drum mounting screws from the rear of the chassis, then remove the main body of the drum assembly. After the replacement has been completed, adjust the drum path.

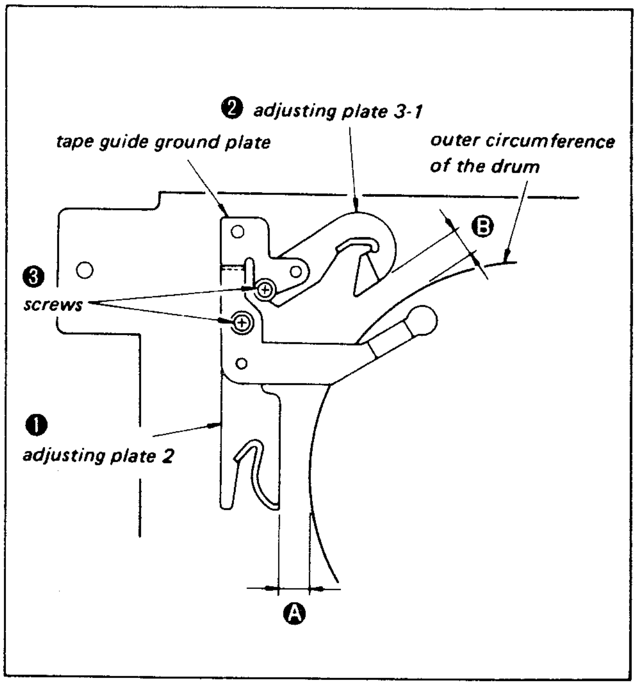

❷ adjusting plate 3-1
tape guide ground plate
outer circumference of the drum
Ⓑ
❸
screws
❶
adjusting plate 2
Ⓐ

Fig. 3-5. Measurement of the position of adjusting plates 2 and 3-1

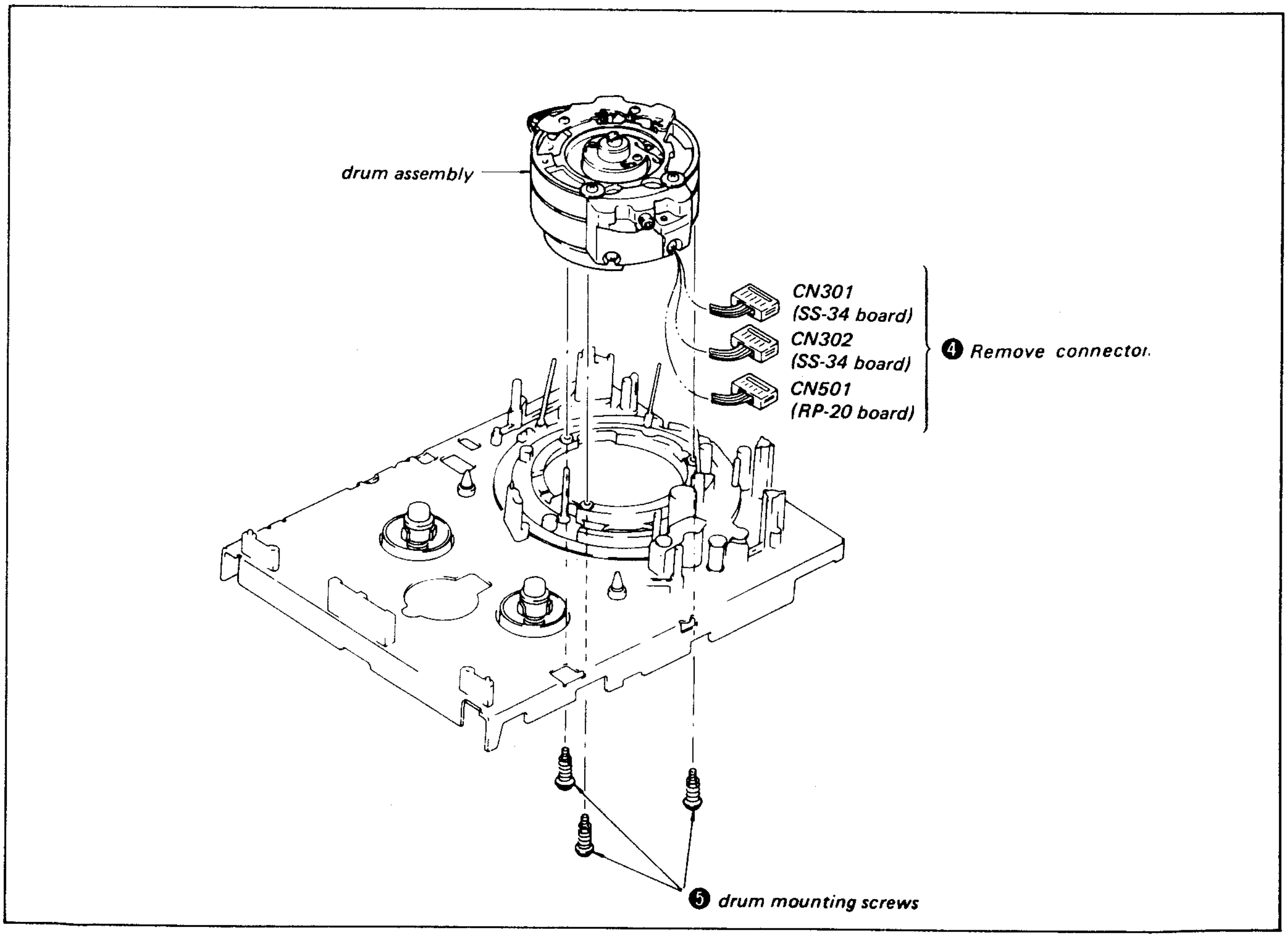

drum assembly
CN301
(SS-34 board)
CN302
(SS-34 board)
CN501
(RP-20 board)
❹ Remove connector
❺ drum mounting screws

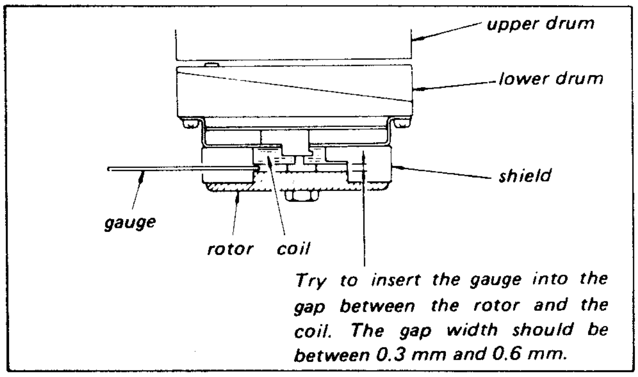
Fig. 3-6. Removal of the drum assembly

3-3-2. Adjustment of the Motor Gap when Replacing the Drum Assembly

After replacing the drum assembly, adjust the gap between the motor rotor and the coil to 0.3 mm to 0.6 mm (Fig. 3-7).

[Procedure]

1) When re-assembling the drum, use the spacers which were removed to produce a gap of between 0.3 mm and 0.6 mm. Measure the gap using the gauge that comes with the drum for assembly and maintenance use. One side of the gauge is 0.3 mm and the other side is 0.6 mm. If the gap is adjusted correctly, the 0.3 mm side should fit in and the 0.6 mm side should not.
2) If this fails to give the correct gap width, do not use the spacers which were removed; instead, use a combination of the 4 0.3 mm accessory spacers to obtain the correct width.

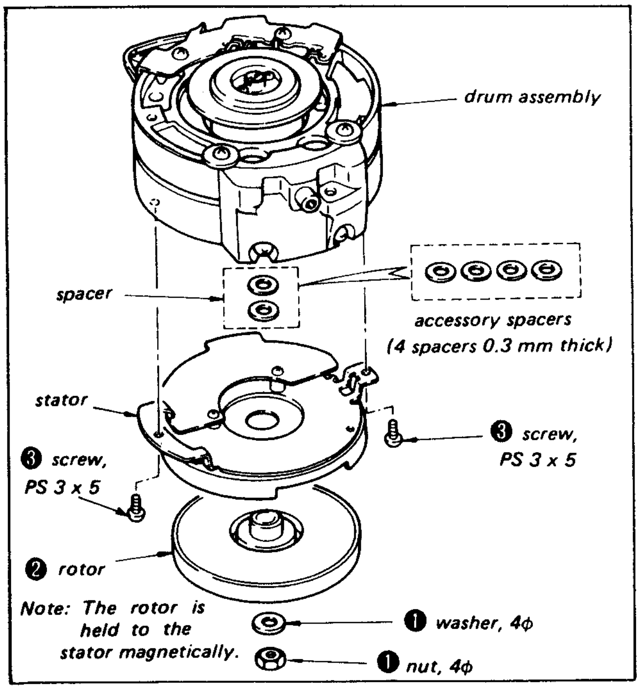

upper drum
lower drum
shield
gauge
rotor
coil

Try to insert the gauge into the gap between the rotor and the coil. The gap width should be between 0.3 mm and 0.6 mm.

Fig. 3-7. Checking the motor gap width after replacing the drum assembly

Removal of the stator and rotor when replacing the drum

1) Remove the nut and washer.
2) Remove the rotor from the stator.
3) Remove the 2 screws, then remove the stator from the main body of the drum.


drum assembly
spacer
accessory spacers
(4 spacers 0.3 mm thick)
stator
❸ screw, PS 3 x 5
❸ screw, PS 3 x 5
❷ rotor
❶ washer, 4ϕ
❶ nut, 4ϕ

Note: The rotor is held to the stator magnetically.

Fig. 3-8. Removal of the stator and rotor when replacing the drum

3-4. REPLACEMENT OF THE CAPSTAN MOTOR

3-4-1. Removal of the Capstan Motor (Fig. 3-9)

- Remove the three screws ❶ then remove the capstan motor from the rear of the mechanical chassis.

  Note:

  When the capstan motor has been removed or replaced, check the tape path once.

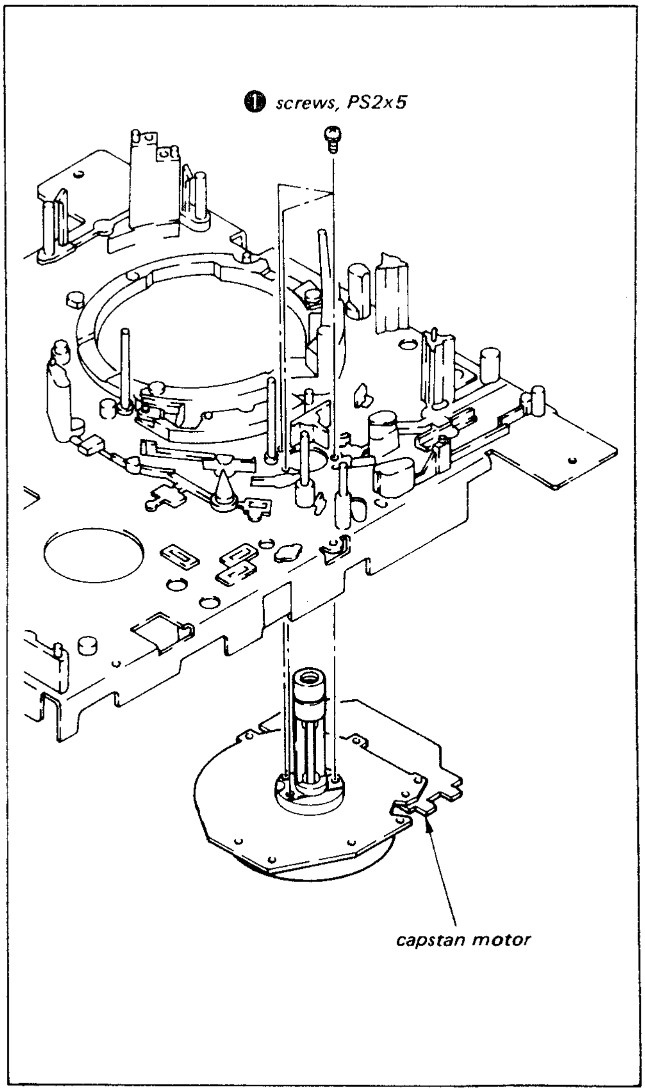

❶ screws, PS2x5
capstan motor

Fig. 3-9 Removal of the capstan motor

3-5. REMOVAL OF THE S COIL SENSOR (Fig. 3-10)

1) Remove the spring.
2) Remove the claw in the direction of arrow Ⓐ,then pull the S coil sensor out.
3) Pull out the connector from CN604 on SS-34 board.

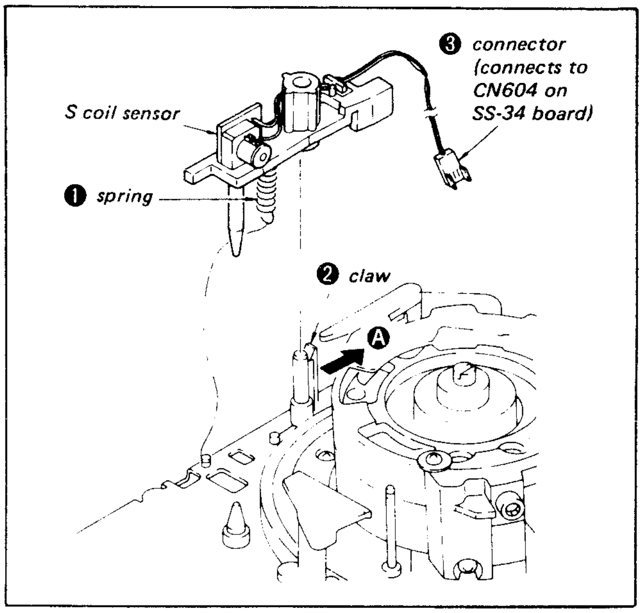

❸ connector (connects to CN604 on SS-34 board)
S coil sensor
❶ spring
❷ claw
Ⓐ

Fig. 3-10. Removal of the S coil sensor

3-6. REMOVAL OF THE FL CASSETTE COMPARTMENT ASSEMBLY (Fig. 3-11)

1) Remove the four screws (BVTP3 x 8) ❶ .
2) Remove the internal gear flange ❷ .
3) Remove the timing belt (loading belt) ❸ .
4) Pull out the connector CN606 ❹ , on the SS-34 board.
5) Remove the FL cassette compartment assembly in the direction shown by the arrow.

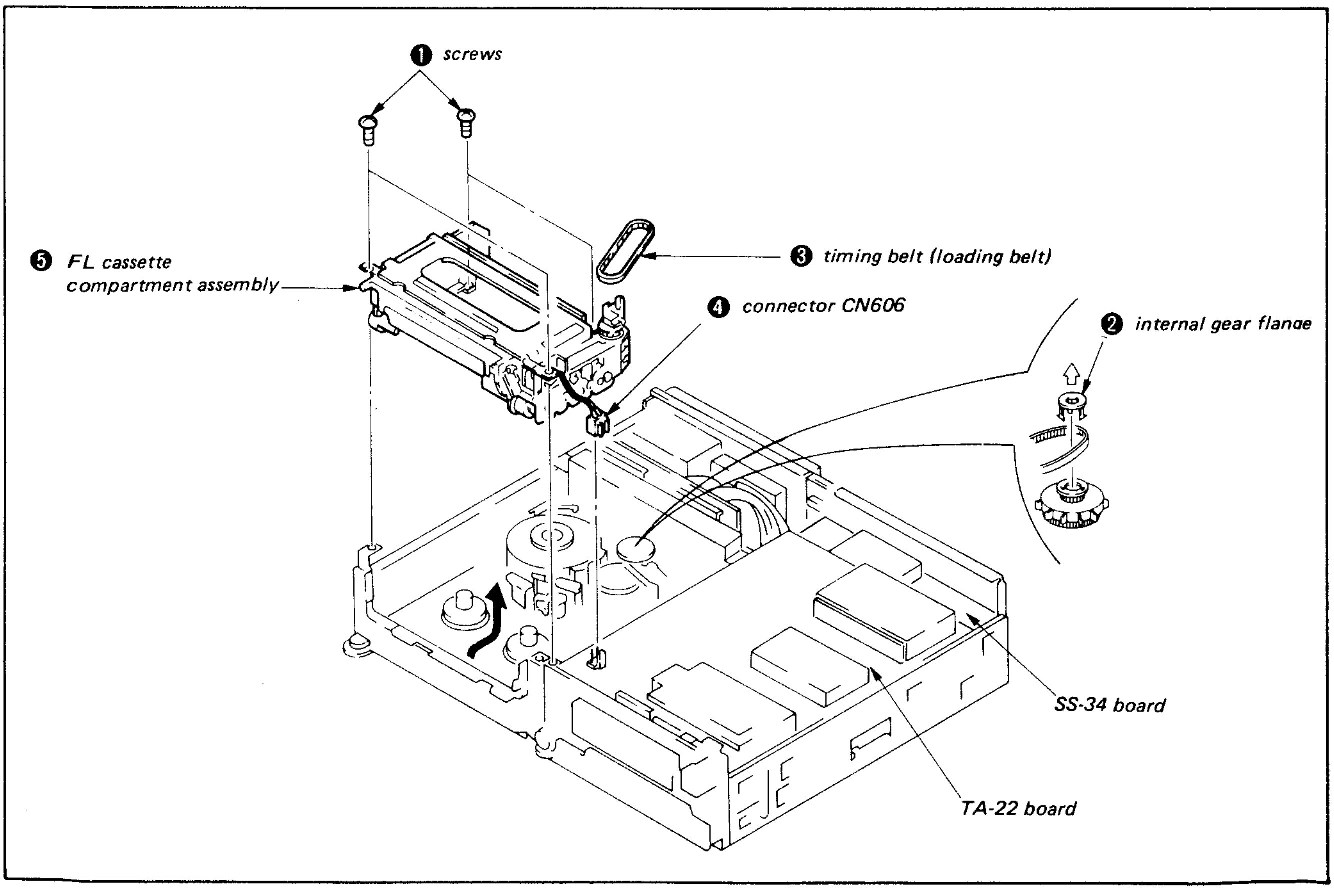

❶ screws
❺ FL cassette compartment assembly
❸ timing belt (loading belt)
❹ connector CN606
❷ internal gear flanoe
SS-34 board
TA-22 board

Fig. 3-11. Removal of the FL cassette compartment assembly

3-7. ADJUSTMENT OF THE FL CASSETTE COMPARTMENT

3-7-1. Adjustment of the Position of the Right Gear of the FL Cassette Compartment Assembly

In the FL cassette compartment assembly, the cassette holder must always move parallel to the mechanical chassis. The gear system is used to control the amount by which the cassette holder advances so that this will be the case. Consequently, if the gears in this section slip out of mesh, the next time the unit is assembled the gear mesh must be adjusted to the correct position: otherwise the cassette will not feed properly.

[Adjustment of the gear positions]

1) Get a positioning rod about 200 mm long and 1.5 mm in diameter ready.
2) While passing the positioning rod through the combination of the drive arm right and cassette ON cam, fit the latter on the right side plate. Similarly, fit the drive arm left onto the left side plate.
3) Similarly, while passing the positioning rod through the worm wheel, fit the latter onto the right side plate.
4) Similarly, while passing the positioning rod through the combination of the limiter gear and cassette OFF cam, fit the latter onto the right side plate.

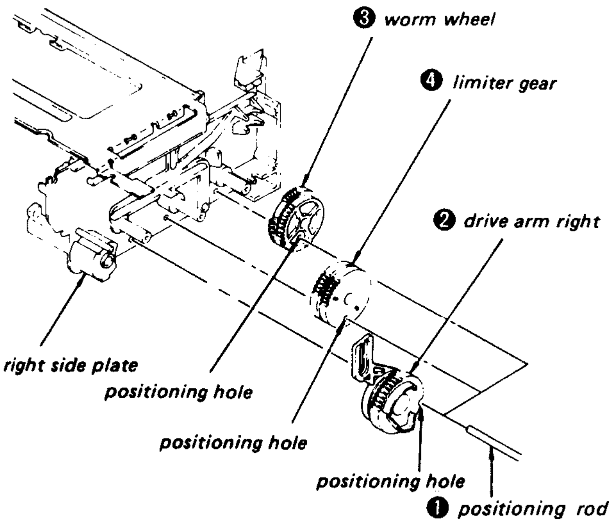

❸ worm wheel
❹ limiter gear
❷ drive arm right
right side plate
positioning hole
positioning hole
positioning hole
❶ positioning rod

Fig. 3-12. Positioning of the FL cassette compartment gears

3-7-2. Cassette ON Switch Operation Check and Adjustment

[Method of checking]

When inserting a cassette into the FL cassette compartment assembly, confirm that, as the cassette is inserted, the leafswitch comes ON when the center of the drive roller is 8 to 13 mm from the end of the guide groove, as shown in Fig. 3-13.

[Method of adjustment]

Bend the tip of the cassette ON switch in the direction of the arrow.
Adjust so that the cassette ON switch comes ON when the above distance is 8 to 13 mm, and finally tighten the screw.

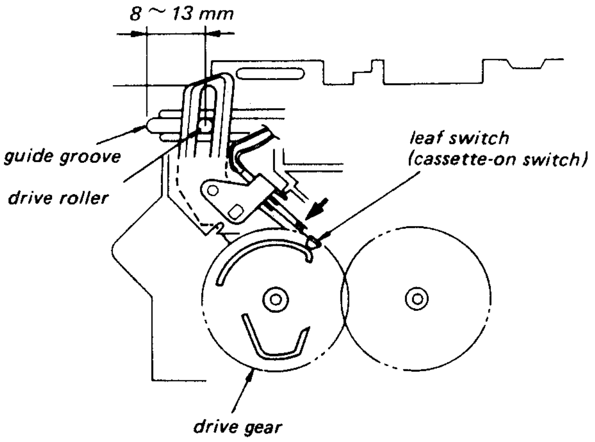

8 ~ 13 mm
guide groove
drive roller
leaf switch
(cassette-on switch)
drive gear

Fig. 3-13. Cassette ON switch operation check and adjustment

3-7-3. Checking and Adjustment of the Cassette Door Assembly

[Method of checking]

With the door opening and closing arm returned all the way in the direction of arrow Ⓐ , check to make sure that the door is vertical.

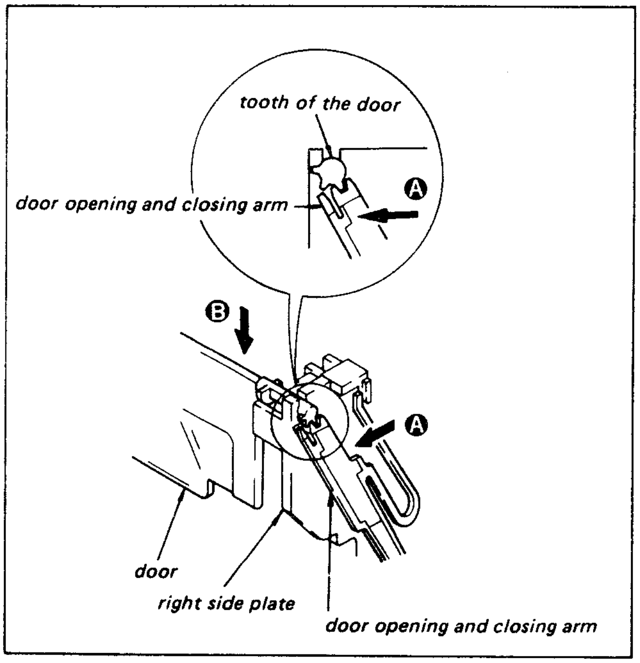

tooth of the door
door opening and closing arm
Ⓐ
Ⓑ
Ⓐ
door
right side plate
door opening and closing arm

Fig. 3-14. Adjustment of the position of the cassette door assembly

[Method of adjustment]

check to make sure that the door opening and closing rack plate has returned all the way. Then, close the door together in the drection of arrow Ⓑ so that it is vertical. and mesh the gears.

3-7-4. Mounting the FL Cassette Compartment Assembly (Fig. 3-15)

1) Hook the two holes of the FL cassette compartment assembly onto the mechanical chassis, then place the compartment in the specified position on the chassis.
2) Loosely tighten the 4 mounting screws of the FL cassette compartment assembly. Move the FL cassette compartment assembly forward and backward with respect to the mechanical chassis, set it in the correct position, then tighten the mounting screws all the way.
3) Connect the timing belt (loading belt) between the threading motor and the worm gear, then hold it in place with the internal gear flange.
4) Press the tension roller arm in the direction of the arrow to adjust the tension of the timing belt (loading belt), then fix it in place with the arm fixing screw.
5) Insert the harness sticking out from the FL cassette compartment into connector CN606 on SS-34 board.

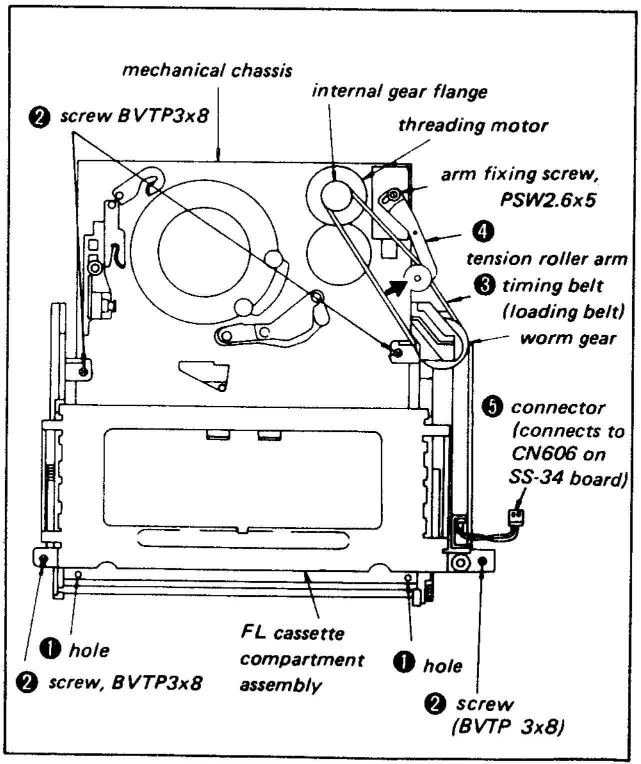
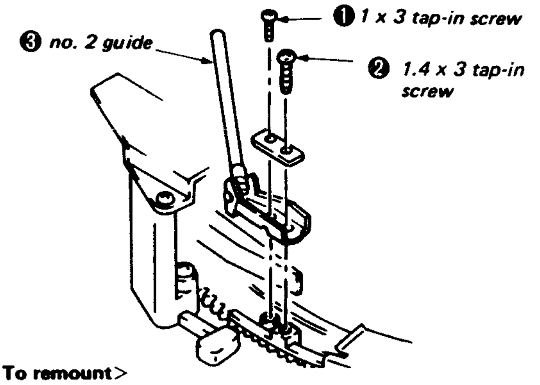

mechanical chassis
internal gear flange
❷ screw BVTP3x8
threading motor
arm fixing screw, PSW2.6x5
❹
tension roller arm
❸ timing belt (loading belt)
worm gear
❺ connector (connects to CN606 on SS-34 board)
❶ hole
❷ screw, BVTP3x8
FL cassette compartment assembly
❶ hole
❷ screw (BVTP 3x8)

Fig. 3-15. Mounting the FL cassette compartment assembly

3-8. REMOVAL OF THE No. 2 AND No. 3 GUIDES

3-8-1. Removal of the No. 2 Guide

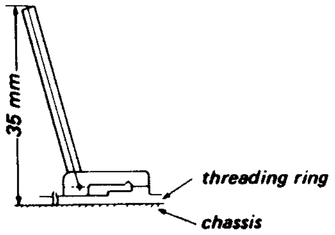
1) Remove the 1×3 tap-in screw.
2) Remove the 1.4×3 tap-in screw.
3) Remove the No. 2 guide assembly.



❶ 1 x 3 tap-in screw
❸ no. 2 guide
❷ 1.4 x 3 tap-in screw

<To remount>

1) Loosely tighten the 1 x 3 tap-in screw.
2) Tighten the 1.4 x 3 tap-in screw all the way.
3) Adjust the 1 x 3 tap-in screw until the height is 35 mm. After adjustment, lock the screw.
Note: The no. 2 guide is up all the way.

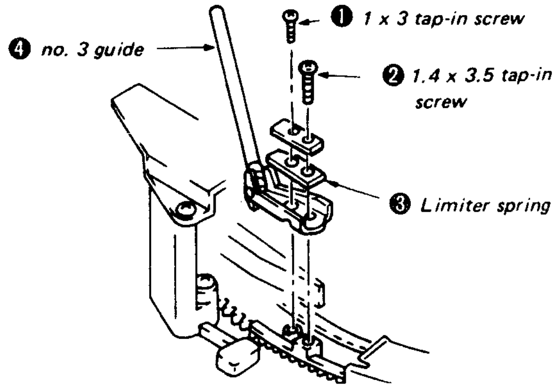


35 mm
threading ring
chassis

Fig. 3-16. Removal of the no. 2 guide

3-8-2. Removal of the No. 3 Guide

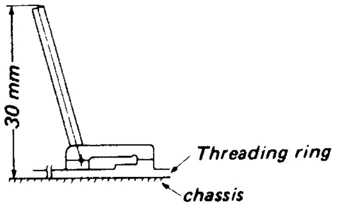
1) Remove the 1×3 tap-in screw.
2) Remove the 1.4×3.5 tap-in screw.
3) Remove the limiter spring.
4) Remove the No. 3 guide assembly.



❶ 1 x 3 tap-in screw
❹ no. 3 guide
❷ 1.4 x 3.5 tap-in screw
❸ Limiter spring

<To remount>

1) Loosely tighten the 1 x 3 tap-in screw.
2) Tighten the 1.4 x 3.5 tap-in screw all the way.
3) Adjust the 1 x 3 tap-in screw so that the height is 30 mm. After adjustment, lock the screw.
Note: The no. 3 guide is up all the way.



30 mm
Threading ring
chassis

Fig. 3-17. Removal of the no. 3 guide

3-9. REPLACEMENT AND ADJUSTMENT OF THE S THREADING RING

3-9-1. Perparation to Remove the S Threading Ring Removal of the ACE Assembly, FE Head and Threading Motor (Fig. 3-18)

1) Remove the cross-recessed head screw.
2) Remove the No. 6 guide nut.
3) Remove the No. 6 washer.
4) Remove the No. 6 guide spacer.
5) Remove the compression coil spring.
6) Remove the 2 guide adjustment screws, then remove the ACE assembly and the FE head.

Note:
Since the ACE assembly and the FE head are connected by a lead wire, be careful when removing them. It is not necessary to remove the compression coil spring below the ACE assembly, but be careful not to use it.

7) Remove the 3 screws, then remove the threading motor assembly by pulling it up and out.

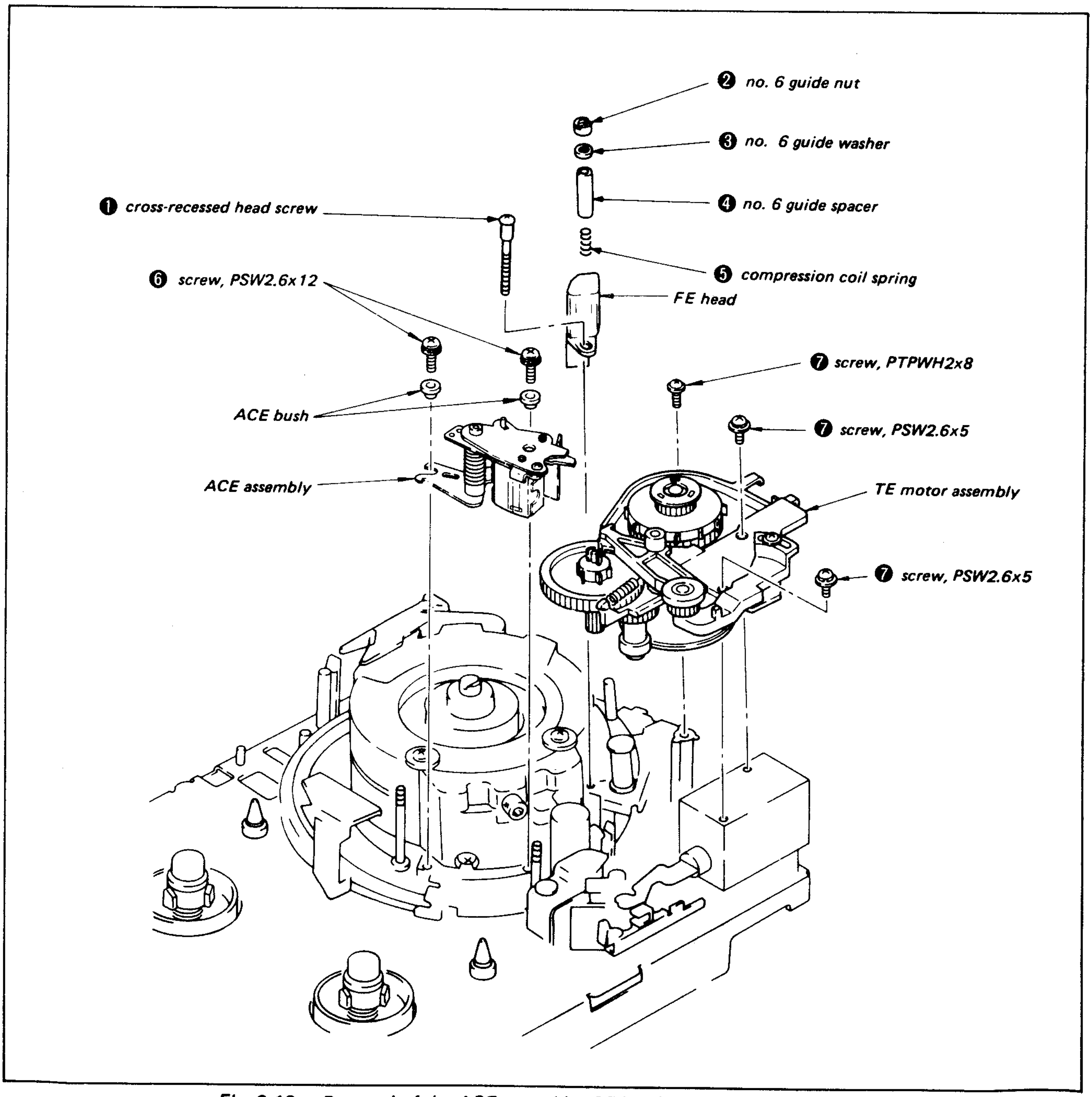

❷ no. 6 guide nut
❸ no. 6 guide washer
❶ cross-recessed head screw
❹ no. 6 guide spacer
❻ screw, PSW2.6x12
❺ compression coil spring
FE head
❼ screw, PTPWH2x8
ACE bush
❼ screw, PSW2.6x5
ACE assembly
TE motor assembly
❼ screw, PSW2.6x5

Fig. 3-18. Removal of the ACE assembly, FE head and TE motor assembly.

Removal of Miscellaneous Parts (Fig. 3-19)

Proceeding in the same manner as in replacement of the drum assembly, measure the width of the gap between the upper drum and the adjusting plates (Fig. 3-5).

1) Remove the screw, then remove the tape guide ground plate and adjusting plates 1 and 2.
2) Remove the two screws, then remove the tape holder assembly.
3) Remove the screw, then remove the guide plate.
4) Remove the 2 PTPWH2x8 screws and the M2.6 screw, then remove shuttle guide 2.
5) Remove the 3 PTPWH2x8 screws and the M2.6 screw. Then remove the 2 claws holding shuttle guide 1-YA in place, and finally remove shuttle guide 1-YA.
6) Remove the slant base assembly.
7) Remove the BVTT2.6x6 screw, then remove the pinch liner link.

Note:

After removing the guide plate, do not thread or unthread a tape with the shuttle guide mounted.

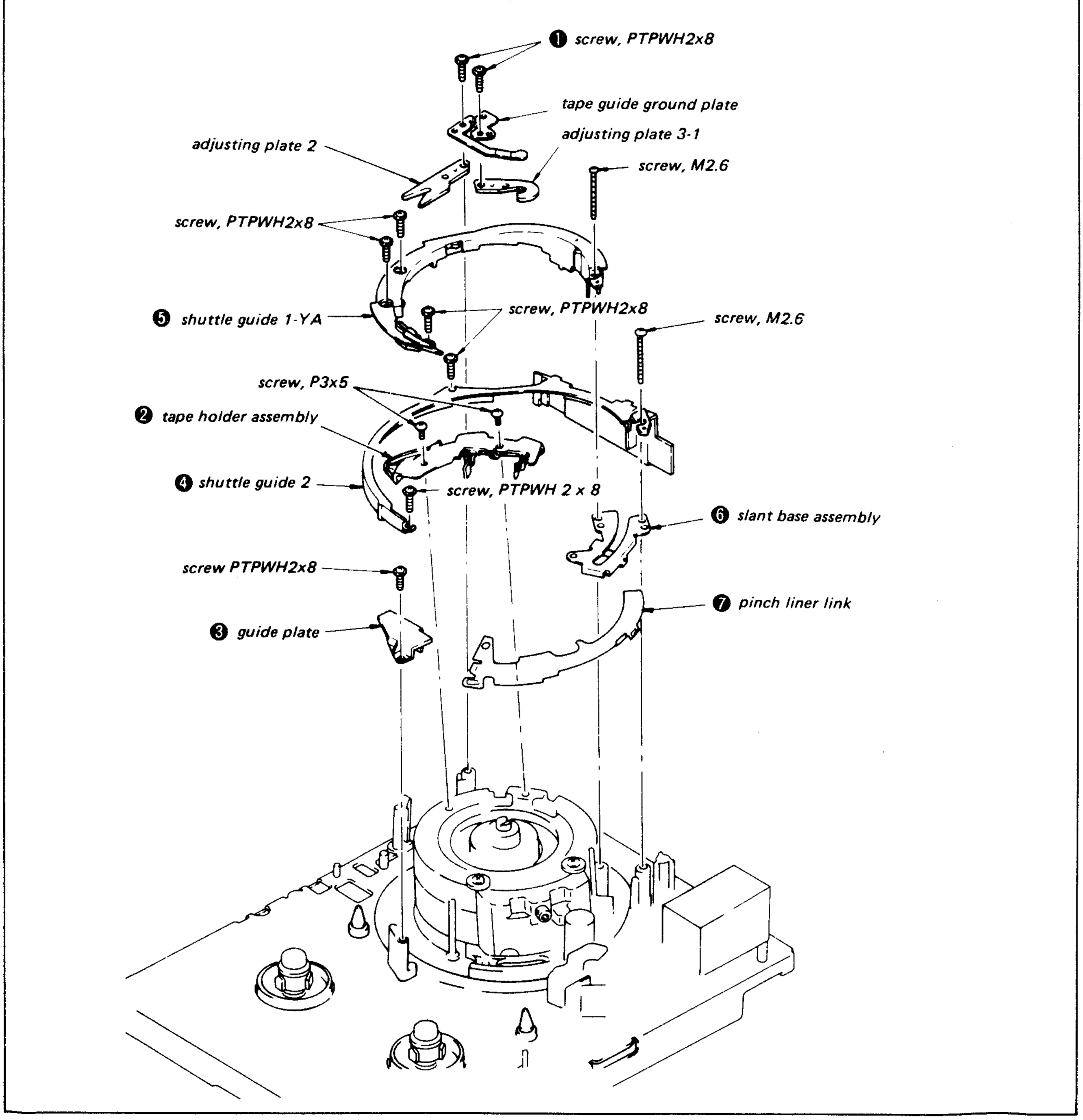

❶ screw, PTPWH2x8
tape guide ground plate
adjusting plate 3-1
adjusting plate 2
screw, M2.6
screw, PTPWH2x8
❺ shuttle guide 1-YA
screw, PTPWH2x8
screw, M2.6
screw, P3x5
❷ tape holder assembly
❹ shuttle guide 2
screw, PTPWH 2 x 8
❻ slant base assembly
screw PTPWH2x8
❼ pinch liner link
❸ guide plate

Fig. 3-19. Removal of miscellaneous parts

3-9-2. Removal of the S Threading Ring (Fig. 3-20)

1) Turn the stop washer and remove the ring roller (B) and (C).
2) Remove the screw. then remove the ring roller adjustment plate.
3) Remove the S threading ring.

Note:
Once a stop washer has been removed, do not use it again.

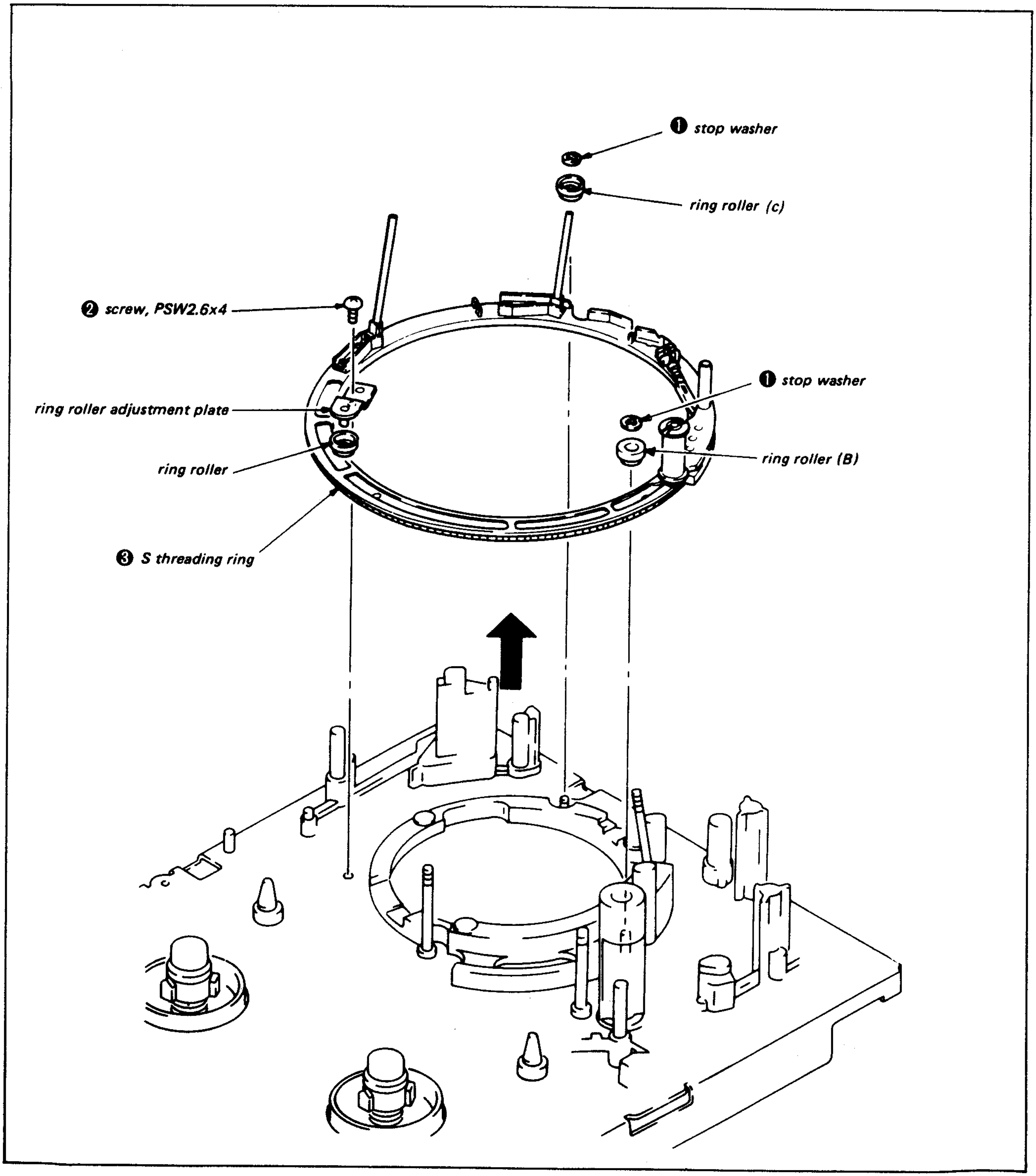

❶ stop washer
ring roller (c)
❷ screw, PSW2.6x4
❶ stop washer
ring roller adjustment plate
ring roller
ring roller (B)
❸ S threading ring

Fig. 3-20. Removal of the S threading ring

3-9-3. S Threading Ring Mounting and Position Adjustment (Fig. 3-21)

1) Set the slider gear assembly in the unthreading completed position.
   (Slider gear assembly set so that it is up against part T slider stop mold.)
2) In this condition, fit the threading ring into place, match the chassis hole (3φ) of part Ⓐ with the S threading ring hole (1.5φ), and mesh with the drive gear teeth.
3) Attach ring roller (B) and fix in place with a stop washer.
4) Attach the ring roller, and fix in place with the adjustment plate.
   Note:
   After replacement and mounting are completed, adjust the ACE assembly as explained in the section on tape path adjustment.

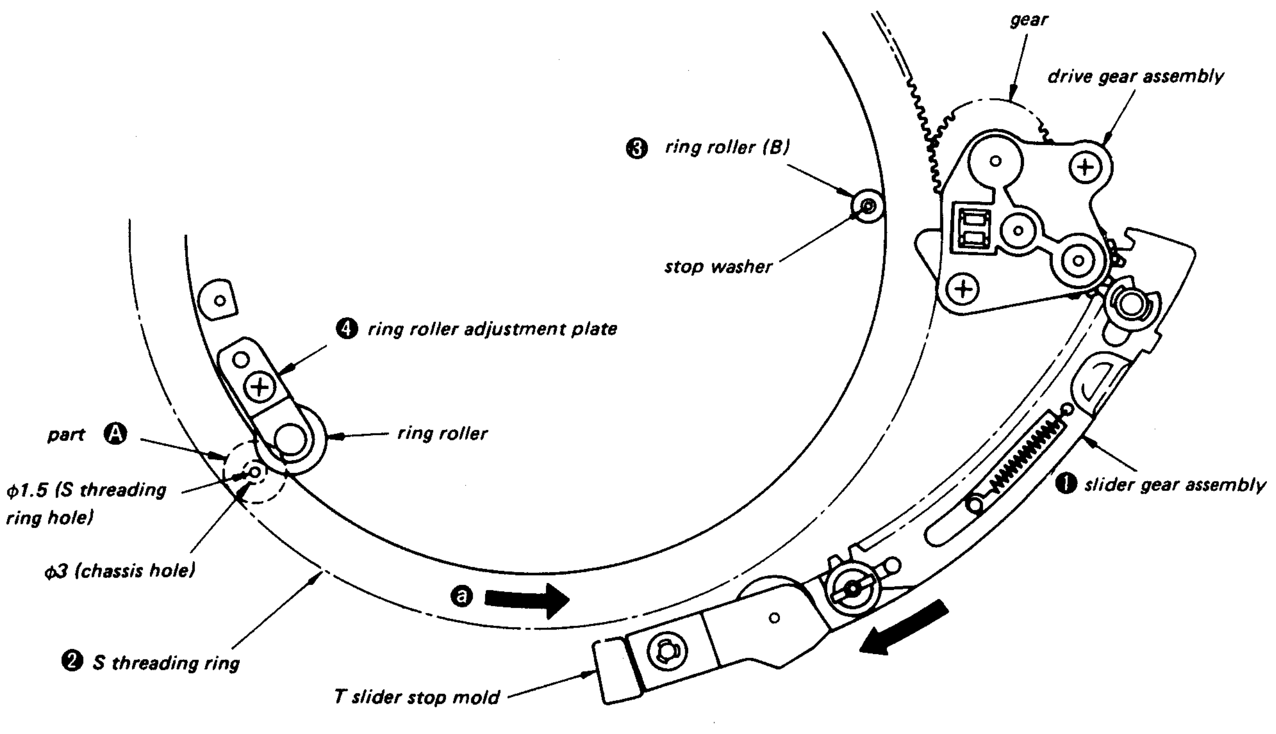

gear
drive gear assembly
❸ ring roller (B)
stop washer
❹ ring roller adjustment plate
part Ⓐ
ring roller
φ1.5 (S threading ring hole)
φ3 (chassis hole)
❶ slider gear assembly
ⓐ
❷ S threading ring
T slider stop mold

Fig. 3-21. S threading ring position adjustment

3-10. PINCH SNAP-FIT LIMITER GAP CHECK AND ADJUSTMENT

[Method of checking]

1) Set in the threading completed condition.
2) With the plunger pushed in all the way, confirm that the thickness of the pinch snap-fit limiter gap is 0.4 mm to 0.6 mm. If it is not, adjust as explained under [method of adjustment] below.

[Method of adjustment]

1) With the pinch solenoid in the absorbed condition (when the plunger is pushed in all the way), loosen the adjustment screw.
2) Press the pinch limiter adjustment plate in the direction of arrow ⓐ with an ordinary screwdriver, as in section Ⓐ in the diagram, and adjust until the thickness of the gap in 0.4 mm to 0.6 mm.
   Tighten the adjustment screw and then lock it to fix everything in place.

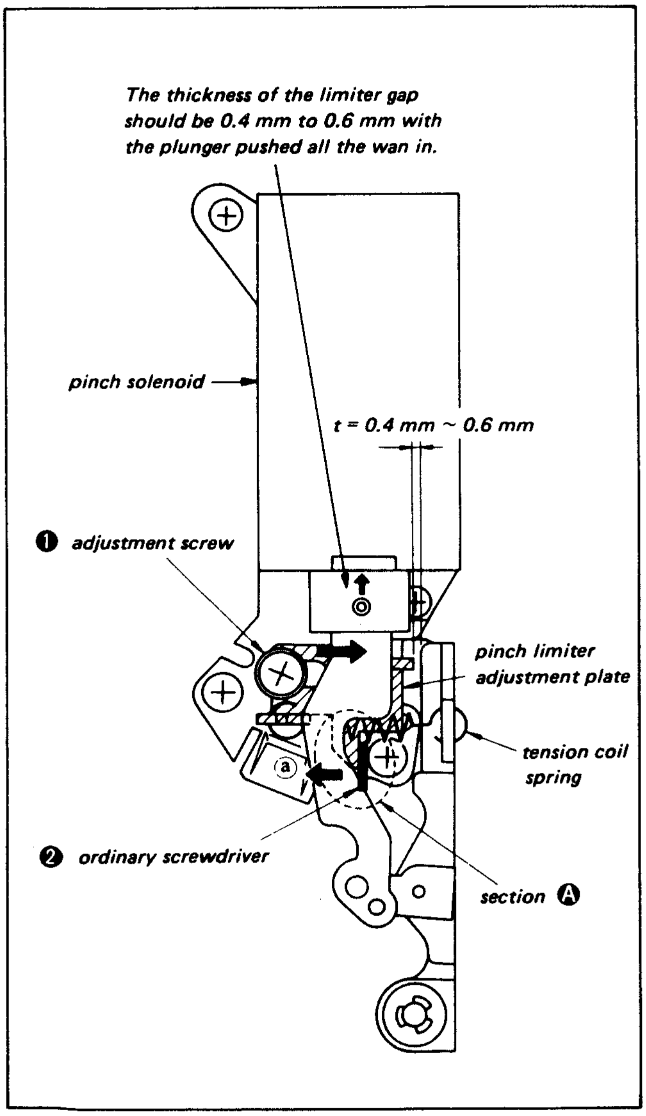

The thickness of the limiter gap should be 0.4 mm to 0.6 mm with the plunger pushed all the wan in.
pinch solenoid
t = 0.4 mm ~ 0.6 mm
❶ adjustment screw
pinch limiter adjustment plate
tension coil spring
ⓐ
❷ ordinary screwdriver
section Ⓐ

Fig. 3-22. Pinch snap-fit limiter gap adjustment plate

3-11. THREADING END SWITCH AND T COIL SENSOR

3-11-1. Threading End Switch (TE Switch) Position Check and Adjustment

[Method of checking]

Turn the S threading ring manually. Check to make sure that, when the lock roller moves from above the straight line part of the notch in the ring (Fig. 3-23 section Ⓐ) to 1/3 of the way down it and back, the TE switch turns ON and OFF.
If the lock roller has to move outside of this range before the switch will turn ON and OFF, adjust as explained below.

[Method of adjustment]

1) Set the lock roller between the top of the notch in the S threading ring and 1/3 of the way down it, turn the TE switch in the direction of the arrow and, when the switch turns ON, fix the TE switch in place.
2) When the adjustment is completed, repeat the check as described above [method of checking].

[Removal]

1) Remove the tension coil spring that is attached to the S coil sensor assembly, then remove the S coil sensor.
2) Remove the lock arm assembly in te direction of arrow Ⓐ

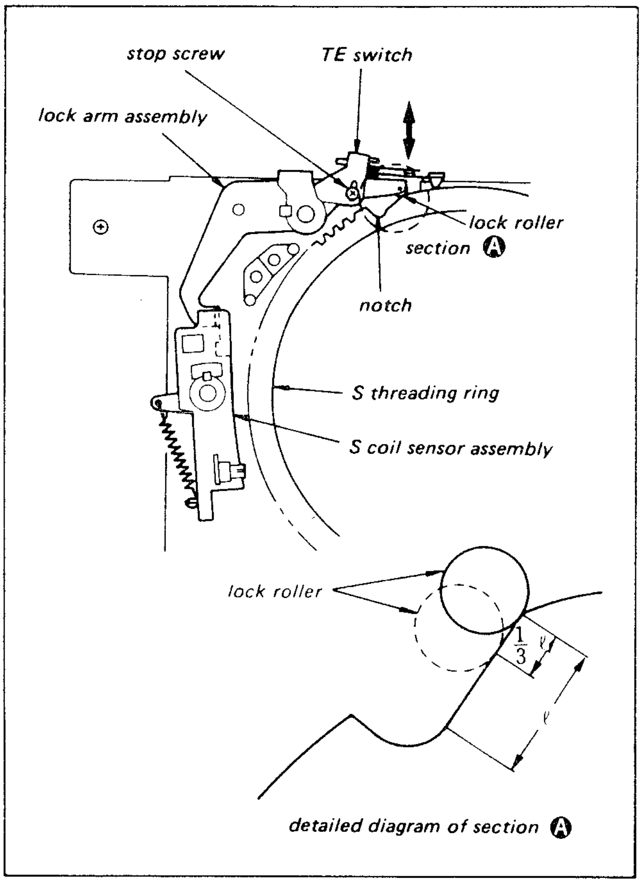

stop screw
TE switch
lock arm assembly
lock roller
section Ⓐ
notch
S threading ring
S coil sensor assembly
lock roller
$\frac{1}{3}\ell$
ℓ
detailed diagram of section Ⓐ

Fig. 3-23. TE switch position adjustment

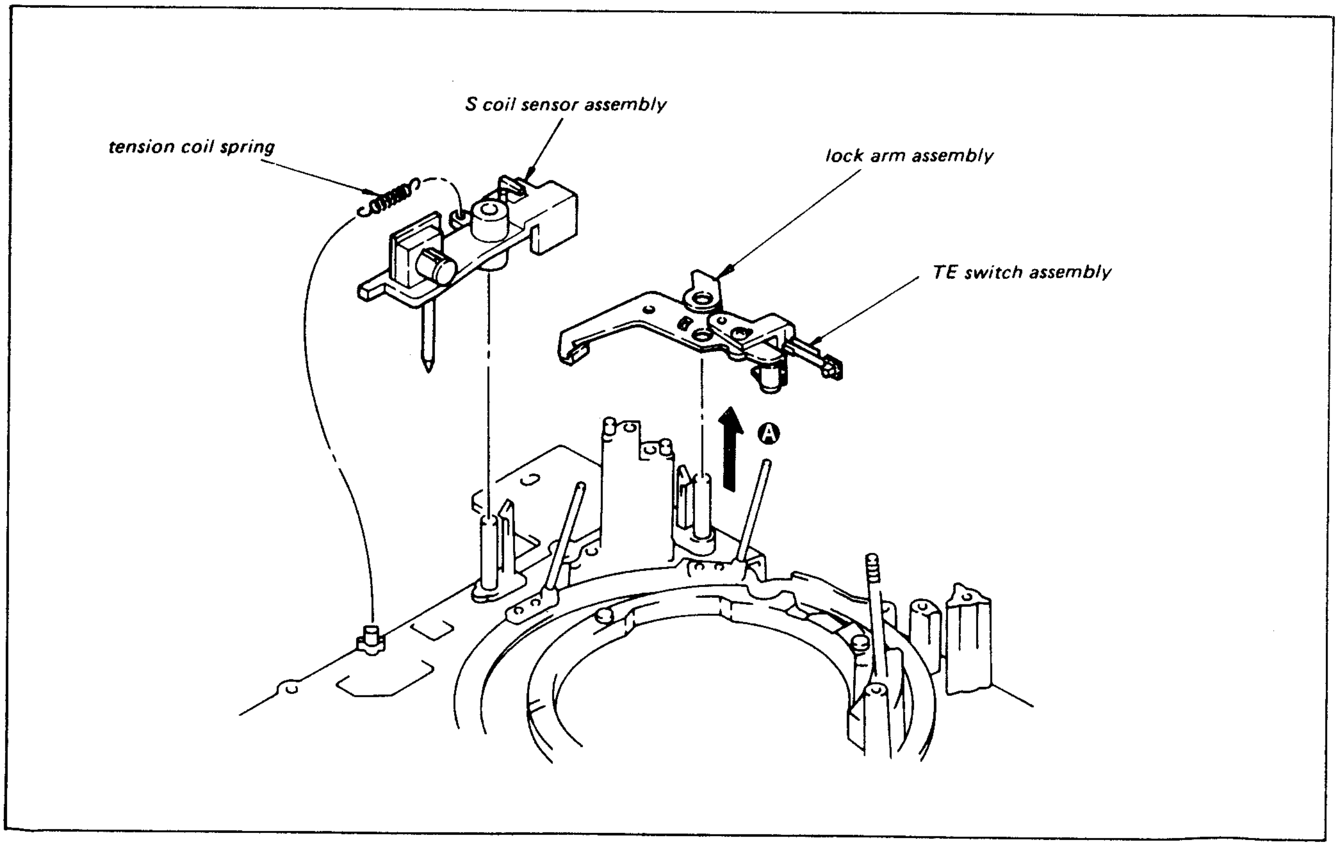
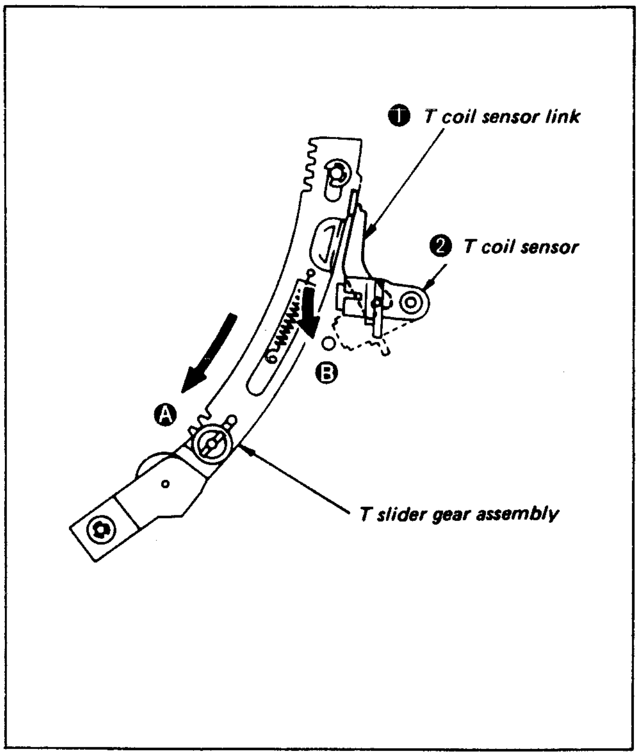

S coil sensor assembly
tension coil spring
lock arm assembly
TE switch assembly
Ⓐ

Fig. 3-24. Removal of the TE switch assembly and lock arm assembly

3-11-2. T Coil Sensor Mounting and Operation Check

[Method of checking]

Confirm that T coil sensor link ❶ is pressed and T coil sensor ❷ moves in the direction of arrow Ⓑ when the T slider gear assembly is moved in the direction of arrow Ⓐ .

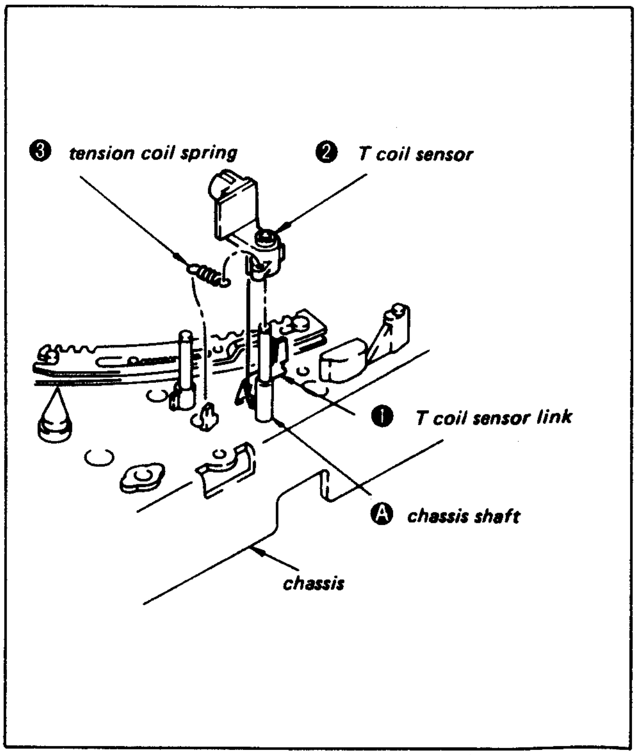


❶ T coil sensor link
❷ T coil sensor
Ⓑ
Ⓐ
T slider gear assembly

Fig. 3-25. T coil sensor operation check.

[Method of mounting]

1) Place T coil sensor link in the prescribed position.
2) Match up the T coil sensor hole with the chassis shaft Ⓐ and insert. Place so that it engages with T coil sensor link.
3) Hook the tension coil spring on the T coil sensor and chassis claw.



❸ tension coil spring
❷ T coil sensor
❶ T coil sensor link
Ⓐ chassis shaft
chassis

Fig. 3-26 T coil sensor link and T coil sensor mounting.

3-12. REMOVAL AND ADJUSTMENT OF THE REEL BLOCK ASSEMBLY

3-12-1. Removal of the Reel Block Assembly

1) Remove the four screws (BVTP3 x 8) ❶ .
2) Remove the reel block assembly ❷ in the direction shown by the arrow.

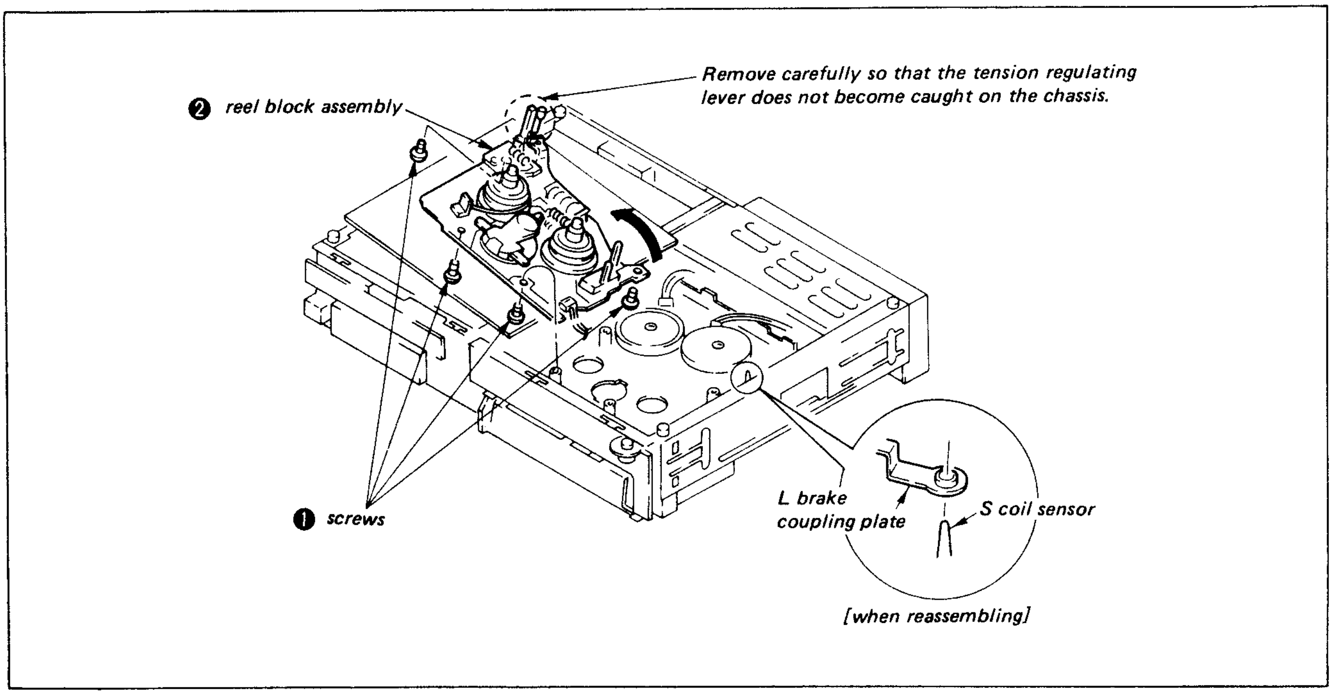

❷ reel block assembly
Remove carefully so that the tension regulating lever does not become caught on the chassis.
❶ screws
L brake coupling plate
S coil sensor
[when reassembling]

Fig. 3-27 Removal of the reel block assembly

3-12-2. Adjustment of the Position of the Tension Regulating Lever

[Method of adjustment]

1) Put the unit in playback mode.
2) Loosen the adjustment spring until the tape guide pin of the tension regulating lever assembly is positioned to the outside of the outer circumference of shuttle guide 2. as shown in Fig. 3-28. Then adjust by moving the tension regulating band assembly in the direction of arrow Ⓐ .
3) After adjustment, tighten the adjustment screw, being careful that the tension regulating band assembly does not move.

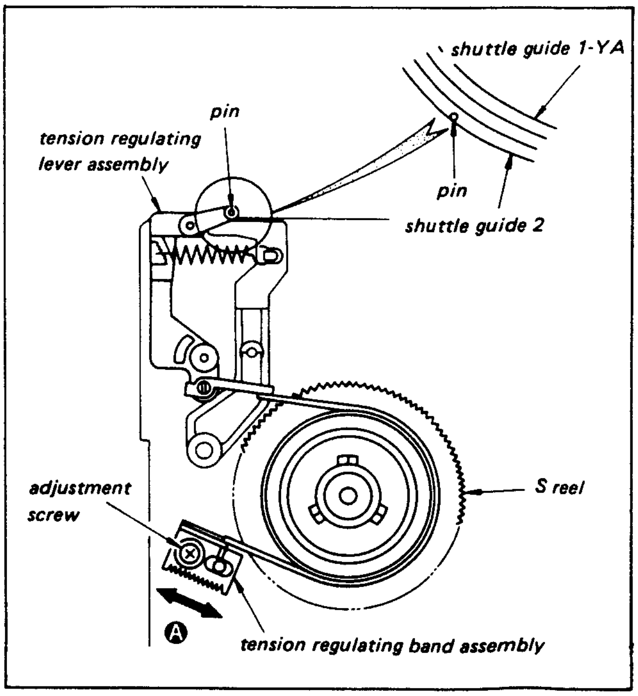

shuttle guide 1-YA
pin
tension regulating lever assembly
pin
shuttle guide 2
S reel
adjustment screw
Ⓐ
tension regulating band assembly

Fig. 3-28 Adjustment of the position of the tension regulating lever

3-13. ADJUSTMENT OF THE FORWARD BACK TENSION

[Method of measurement]

1) Insert the torque cassette (SL-0003C) and put the unit in playback mode.
2) Read the value on the meter on the S reel side after the needle has gone around about once.
   The correct value is 31 g·cm – 35 g·cm

Notes:

i) **The set must be perfectly level during this measurement.**
ii) **After the measurement, the tape can become slack when the stop button is pressed. If this happens set the unit is forward mode to take up the slack before removing the tape.**

[Method of adjustment]

Move the position of the tension coil spring that is hooked on the tension regulating lever assembly in the direction of arrow Ⓐ until the measured value falls within the correct range.

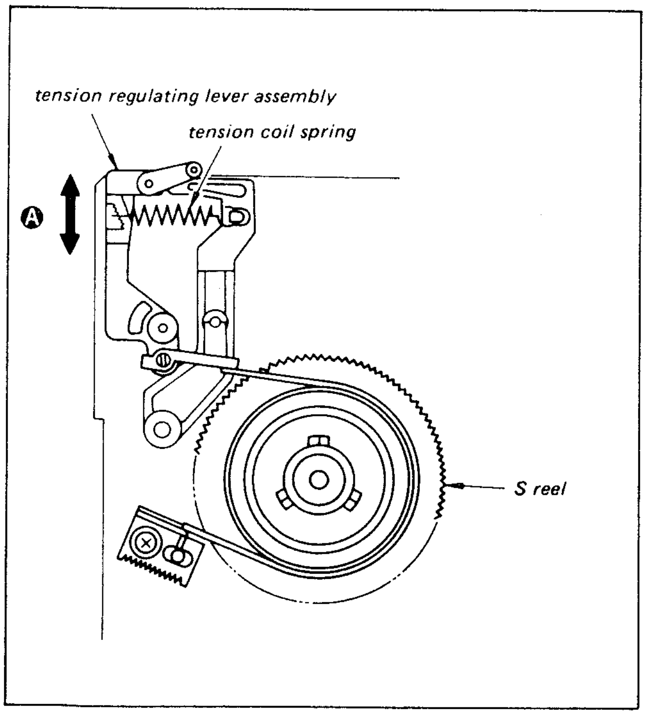


Fig. 3-29 Adjustment of the back tension

3-14. ADJUSTMENT OF THE FORWARD TORQUE

[Method of measurement]

1) Insert the torque cassette (SL-0003C) and start to record a telecast.
2) Read the value on the meter on the T reel side after the needle has gone around about once. The correct range is 80 g·cm ±5 g·cm.

[Method of adjustment]

1) Remove the front panel.
2) Turn potentiometer RV308 on SS-34 board to adjust the torque until its value falls within the correct range.

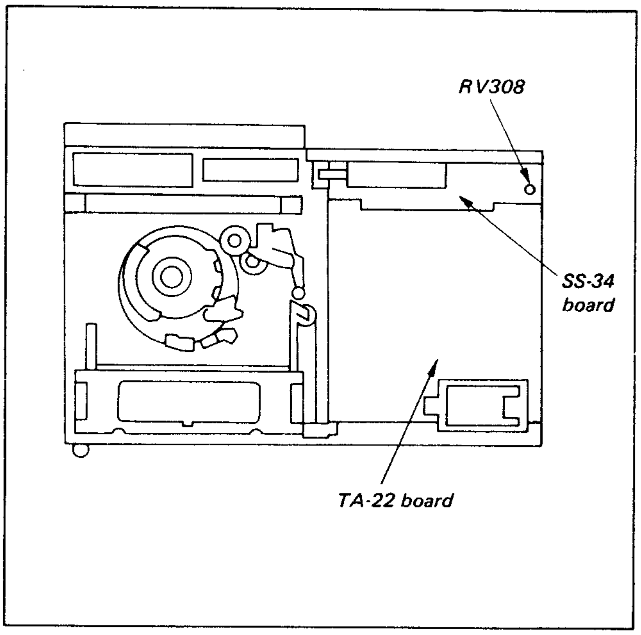


Fig. 3-30. Adjustment of the forward torque

Note:

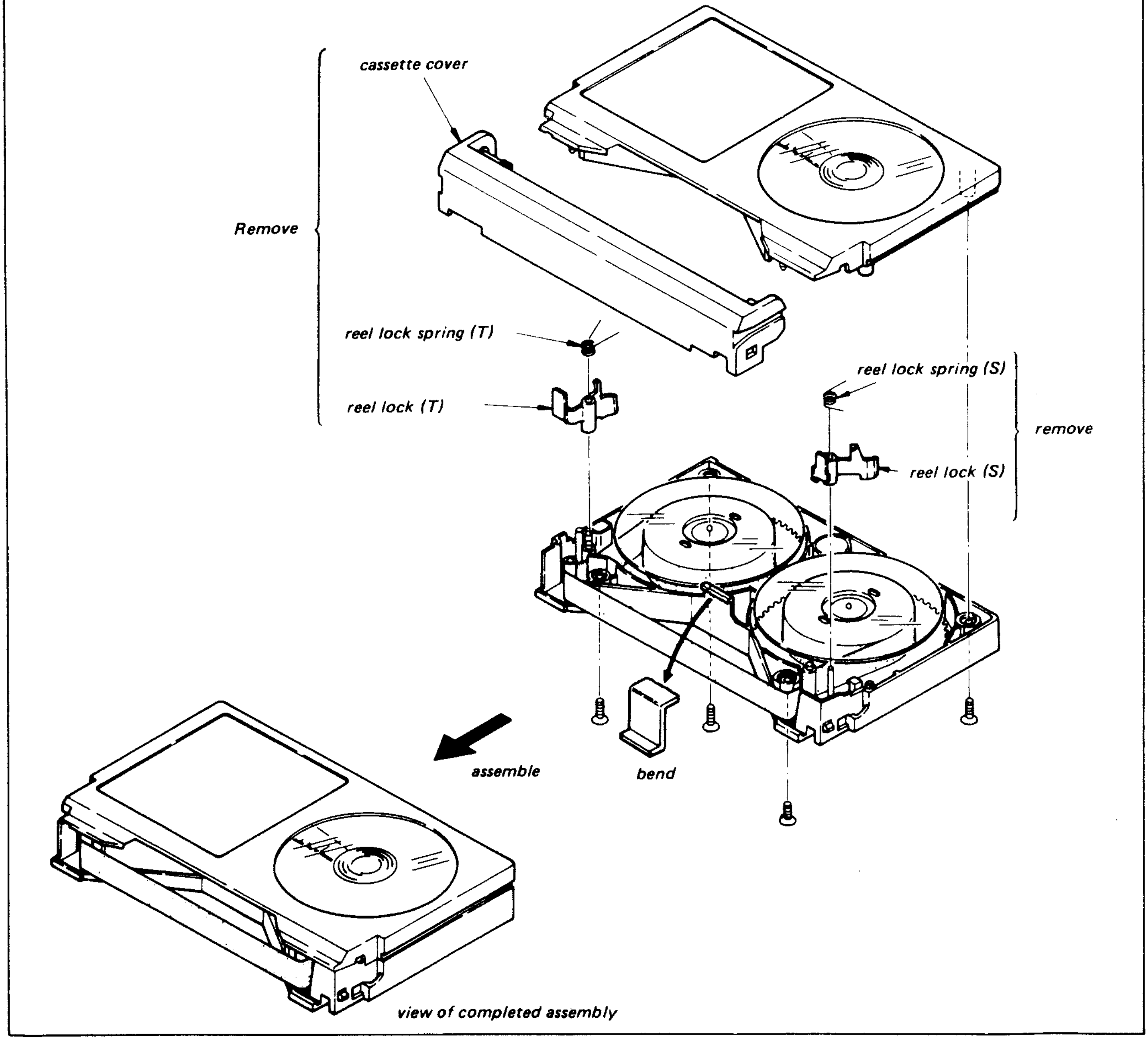
When the forward torque is weakened during the measurement the tape can become slack, in which case the set will go into emergency stop mode. In such a case, the only switches that will work are the cassette eject switch and the power switch. It is necessary to temporarily remove the cassette, or to turn the power OFF and back ON.

4. TAPE PATH ADJUSTMENT

4-1. TRACKING ADJUSTMENT

This adjustment has a large effect on the picture quality in each mode and on the interchangeability of tapes, so it should be done carefully.

4-1-1. Preparation for adjustment
4-1-2. Adjustment on the entrance side
4-1-3. Adjustment on the exit side

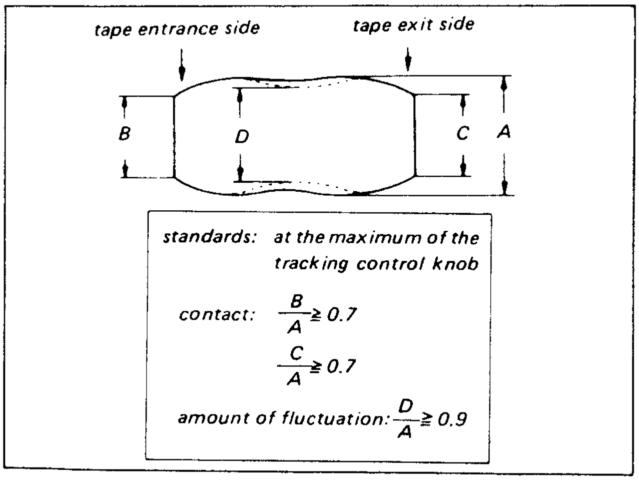


cassette cover
Remove
reel lock spring (T)
reel lock (T)
reel lock spring (S)
remove
reel lock (S)
assemble
bend
view of completed assembly

Fig. 4-1.

4-1-1. Preparation for Adjustment

1) Remove the cassette cover of the alignment tape in accordance with Fig. 4-1.
2) Clean the surface contacted by traveling tape (tape guide, drum tape trailing surface capstan shaft pich roller. ACE FE head surface) with a chamois cloth dipped in methanol.
3) Connect the oscilloscope as follows:
   Channel 1: Pin ⑥ of CN502 (RP-20 board)
   External trigger: Pin ③ of CN502 (RP-20 board)
4) Play back the 1 kHz signal on the tracking section of the alignment tape.
5) Confirm that the oscilloscope radio frequency output waveform is flat and that the amplitude is a maximum. (Turn the tracking knob right and left to increase and decrease the amplitude while the waveform remains flat.) When the amplitude of the waveform is a maximum, confirm that the fluctuations and contact of the radio frequency output waveform meet the standards given in Fig. 4-2. If they do not, go through the procedure given in step 6).
6) If the entrance waveform cannot be made flat, as shown in Fig. 4-3 (a), by turning the tracking knob, go through the "entrance side adjustment" described in 4-1-2: if the exit waveform shown in Fig. 4-3 (b) cannot be made flat, go through the "exit side adjustment" in 4-1-3.



standards: *at the maximum of the tracking control knob*

contact: $\frac{B}{A} \geq 0.7$

$\frac{C}{A} \geq 0.7$

amount of fluctuation: $\frac{D}{A} \geq 0.9$

Fig. 4-2.

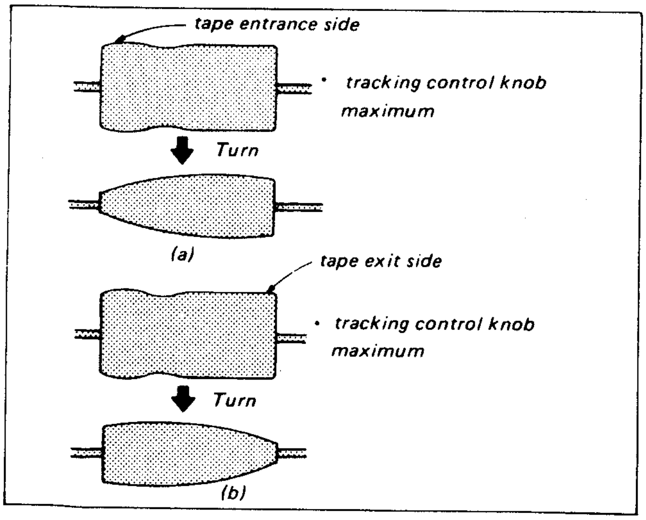

tape entrance side
• tracking control knob maximum
Turn
(a)
tape exit side
• tracking control knob maximum
Turn
(b)

Fig. 4-3.

4-1-2. Entrance Side Adjustment

Whenever the entrance side adjustment is performed, the exit side adjustment must also be performed. The various tape guides and adjustment positions are shown in Fig. 4-5.

1) Turn the No. 6 guide counterclockwise to free the movement of the tape as it enters the drum.
2) Turn the tracking control knob to the right until the amplitude of the waveform is about 60% of its maximum.
3) Loosen No. 5 guide lock screw ❶ and turn the No. 5 guide until the entrance waveform sticks up a little above flat, as shown in the figure below. Then tighten the No. 5 guide lock screw (Fig. 4-6).
   Note:
   After tightening No.5 guide lock screw ❶, confirm that it is as in the figure below.

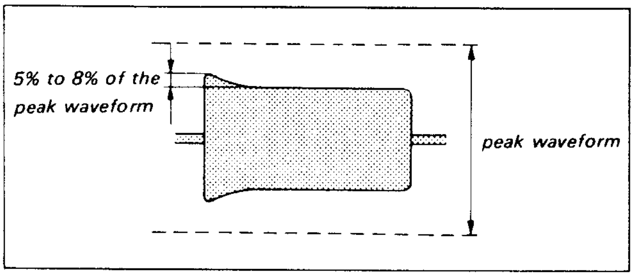


Fig. 4-4.

4) Next, lower the No. 6 guide until the waveform is flat.
5) Press the tape down between the No. 4 and No.5 guide with a finger to lower the entrance side radio frequency waveform, then let go and confirm that the waveform returns to what it was before.
6) In this condition, check the clearance and curl of the No. 5 guide. If there are clearance and curl, adjust as explained in subsequent sections.

Note:

The tape tension between the No. 3, No. 4 and No. 5 guides must be balanced. If it is not, adjust the tilt of the No. 3 and No. 5 guides.

If the waveform cannot be made to look as shown in Fig. 4-4, or if when the tape is pressed and released on the entrance side it takes time for the waveform to return to what it was before, or if it does not return to what it was before, adjust according to the instructions given below.

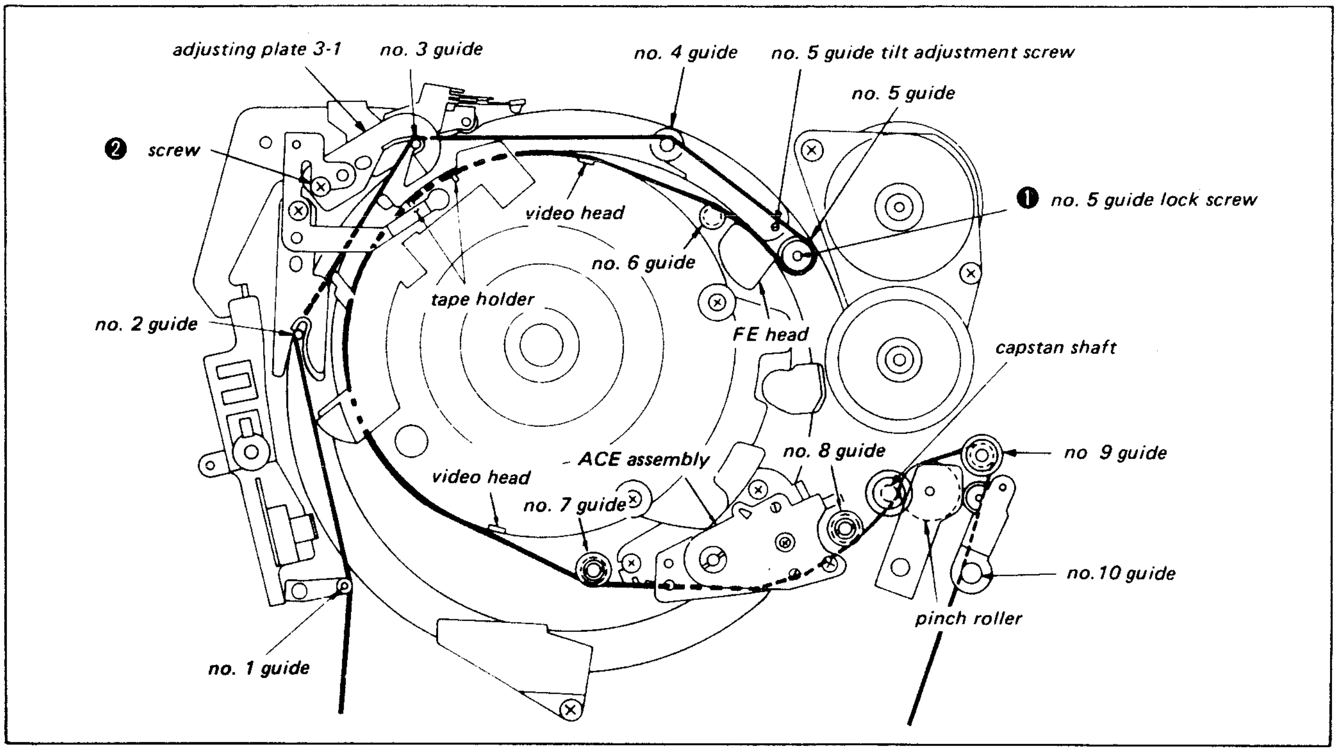

adjusting plate 3-1
no. 3 guide
no. 4 guide
no. 5 guide tilt adjustment screw
no. 5 guide
❷ screw
❶ no. 5 guide lock screw
video head
no. 6 guide
tape holder
no. 2 guide
FE head
capstan shaft
ACE assembly
no. 8 guide
no 9 guide
video head
no. 7 guide
no. 10 guide
pinch roller
no. 1 guide

Fig. 4-5. Tape guide layout diagram

[Waht to do when the waveform entrance output will not rise]

1) Check to see if the up-down tension between the No. 3 No. 4 and No. 5 guides is uniform. If it is not, adjust the tilt of the No. 3 and No. 5 guides.

   Note:

   The lower flange of the No. 4 guide must not protrude.

2) Raise the lower flange of the No. 4 guide to raise the entrance output.

   Note:

   It is sufficient to raise the lower flange of the No. 4 guide to 0.4 mm from its lowest position (within a rotation angle of 360°).

3) If the operation performed in step 2) fails to raise the waveform output, turn the No. 5 guide tilt adjustment screw slightly to the left, and the entrance output should rise.

[What to do when the waveform entrance output will not drop]

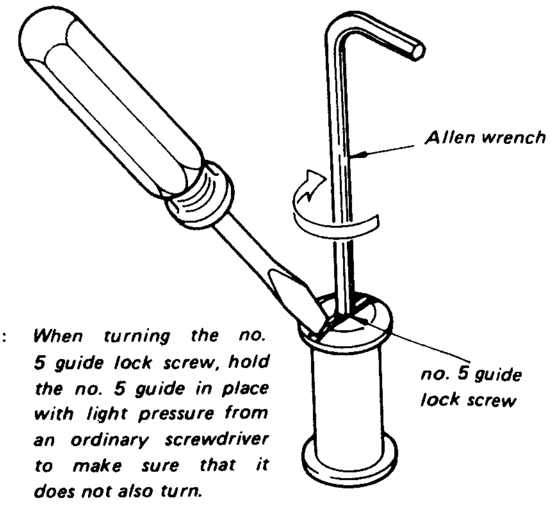
1) Remove the adjusting plate 3-1 of the No. 3 guide from the drum. Just before the lower tension of the tape becomes slack, tighten screw ❷.
2) If the tape is in contact with the lower flange of the No. 4 guide, lower the flange. If the tape is sticking up from the lower flange, adjust the tilt of the No. 5 guide so that the tape does not stick up from the lower flange of the No. 4 guide.

[What to do when there is a clearance in the No. 5 guide]
Turn the No. 4 guide counterclockwise to run the tape upward and eliminate the clearance in the No. 5 guide.

Note:
At this time make sure that a large curl is not produced below the No. 4 guide.

[What to do when there is a curl]

1) When there is a gap below the No. 4 guide: Just before the lower tension on the tape becomes slack, move adjusting plate 3-1 of the No. 3 guide to the outside.
2) When there is not a gap below the No. 4 guide (when there is a curl below the No. 4 guide):
   i) Check to see if the No. 4 guide has been raised up too high. If it has been raised up too high, turn the adjusting plate clockwise to lower the No. 4 guide.
   ii) If the curl still has not been removed after i), tighten the No. 5 guide tilt adjustment screw in the clockwise direction until the curl is removed.


Allen wrench
no. 5 guide lock screw

Note: *When turning the no. 5 guide lock screw, hold the no. 5 guide in place with light pressure from an ordinary screwdriver to make sure that it does not also turn.*

Fig. 4-6.

4-1-3. Exit Side Adjustment

1) Connect the oscilloscope to pin ⑥ of CN502 (RP-20 board). Connect the external trigger to pin ③ of CN502.
2) Play the tracking section of the alignment tape. Adjust the tracking knob to reduce the amplitude of the radio frequency output waveform to 60% of its maximum level.
3) Watch the radio frequency output waveform when the No. 7 and No. 8 guides are raised (by turning the respective guide nuts counterclockwise) to let the tape run free. This waveform is called to exit free waveform.

Note:

Be careful not to raise the guides too far. They should be raised only about 0.2 to 0.3mm.

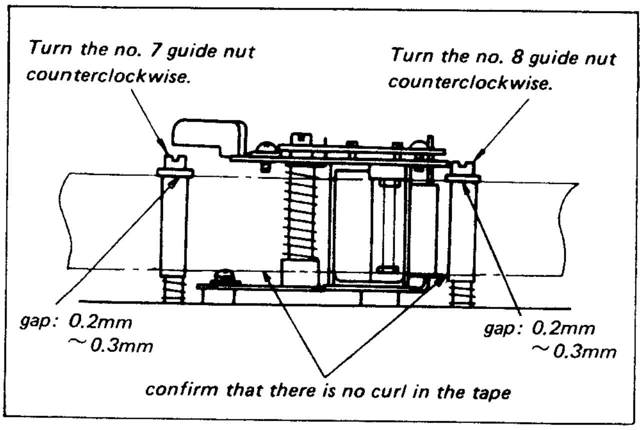

Turn the no. 7 guide nut counterclockwise.
Turn the no. 8 guide nut counterclockwise.
gap: 0.2mm ~0.3mm
gap: 0.2mm ~0.3mm
confirm that there is no curl in the tape

Fig. 4-7.

4) At this time, confirm that the exit free waveform is within the range shown in Fig. 4-8 (a) and (b).
   - If it is outside of this range, adjust according to the procedure in 4-3.

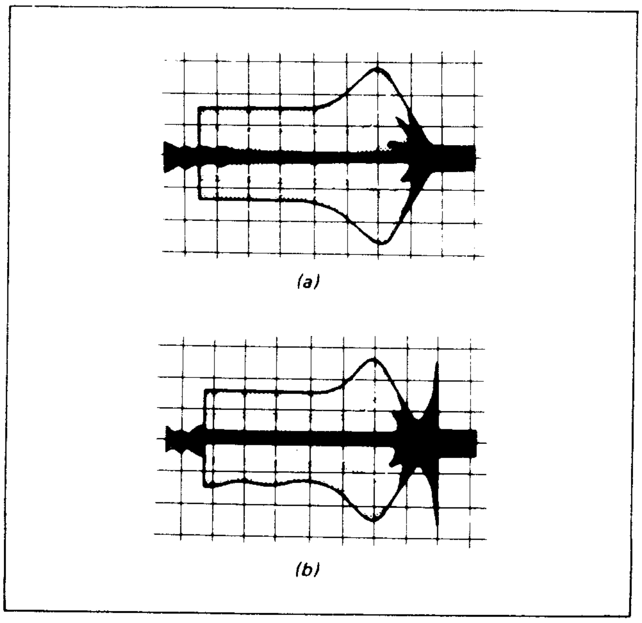


Fig. 4-8.

5) Turn the No. 7 guide nut clockwise until the waveform is flat.
6) Turn the No. 8 guide nut clockwise until the No. 8 guide is lined up with the tape (just before the waveform starts to change lower the guide until there is no curl).
7) During playback, confirm that no curl occurs in the No. 7 guide or the No. 8 guide.
8) During review confirm that no curl or clearance occurs in the No. 8 guide. If there is a curl or clearance, adjust using the No. 9 guide. After adjustment, lock the guide nut.

4-2. ADJUSTMENTS AFTER REPLACEMENT OF THE ACE ASSEMBLY

After removal or replacement of the ACE assembly perform the adjustments listed below.

4-2-1. Exit side tracking adjustment
4-2-2. CTL head (ACE assembly) position adjustment
4-2-3. Audio head (ACE assembly) azimuth adjustment
4-2-4. Audio head (ACE assembly) height adjustment

4-2-1. Exit Side Tracking Adjustment

1) Set the parallel plate (SL-0657 in the list of fixtures and tools) up against the unit as shown in Fig. 4-9, and turn the tilt adjustment screw to adjust the audio head vertically.

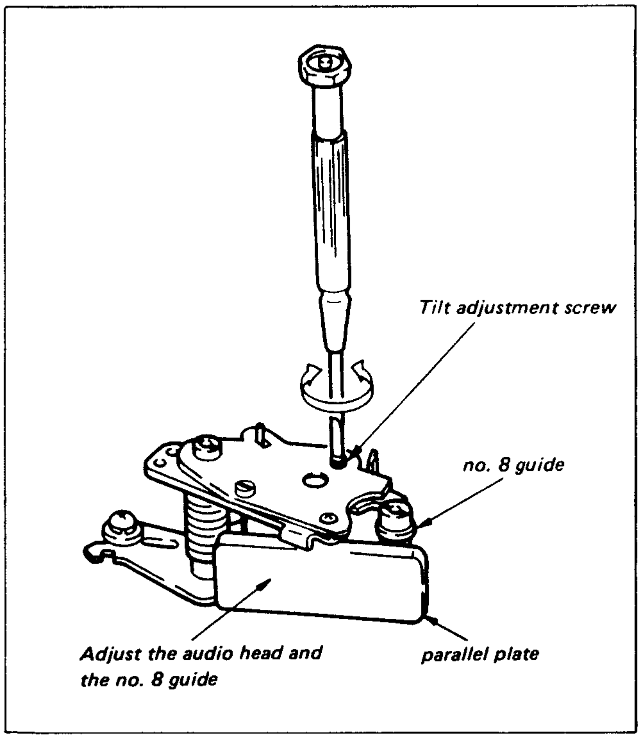

Tilt adjustment screw
no. 8 guide
Adjust the audio head and the no. 8 guide
parallel plate

Fig. 4-9.

2) Connect the oscilloscope to pin ⑥ of connector CN502 (RP-20 board). Connect the external trigger to pin ③ of CN502.
3) Play the tracking section of the alignment tape. Adjust the tracking knob until the radio frequency output waveform amplitude is reduced to about 60% of its maximum level, maximum level.
4) Raise the No. 7 and No. 8 guides (turn the respective guide nuts counterclockwise) and observe the radio frequency exit free waveform when the tape runs free.

   Note:

   Be careful not to raise the guide too far. Raise it about 0.2 to 0.3 mm.

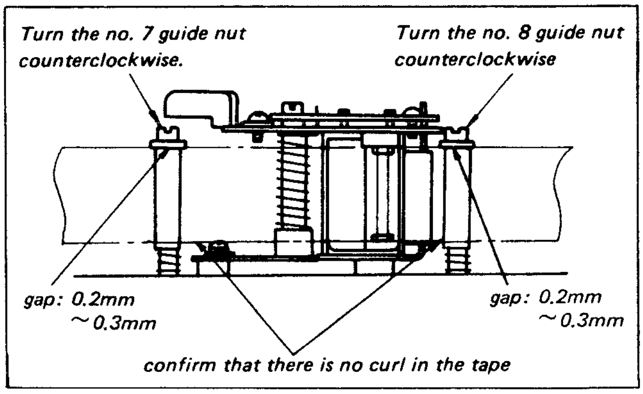

Turn the no. 7 guide nut counterclockwise.
Turn the no. 8 guide nut counterclockwise
gap: 0.2mm ~0.3mm
gap: 0.2mm ~0.3mm
confirm that there is no curl in the tape

Fig. 4-10.

5) At this time, confirm that the exit free waveform is within the range shown in Fig. 4-11 (a) and (b).

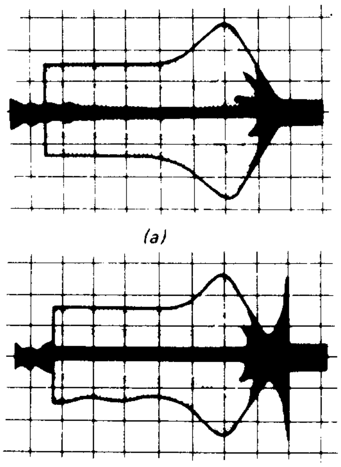

(a)
(b)

Fig. 4-11.

[When the waveform is outside this range]

- When the waveform is outside this range and has the form shown in Fig.4-12. turn the tilt adjutment screw clokwise to adjust until the waveform is whthin the required range.

  Note:

  Complete the adjustment by turning the adjustment screw in the direction of tightening (clockwise).

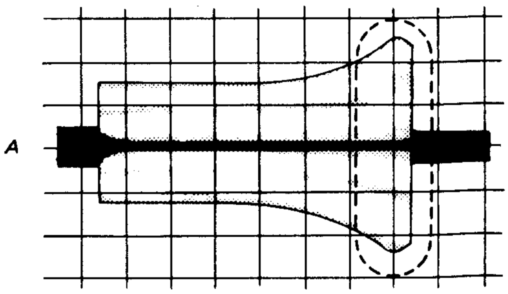


Fig. 4-12.

- When the exit free waveform is outside of the required range and has the form shown in Fig. 4-13, turn the tilt adjustment screw counterclockwise to produce waveform A (Fig. 4-12), then turn it clockwise to bring the waveform within the required range.

Note:

Finish the adjustment by turning the adjustment screw in the direction of tightening (clockwise).

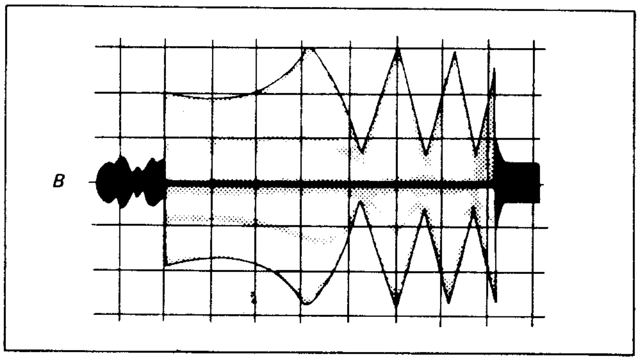


Fig. 4-13.

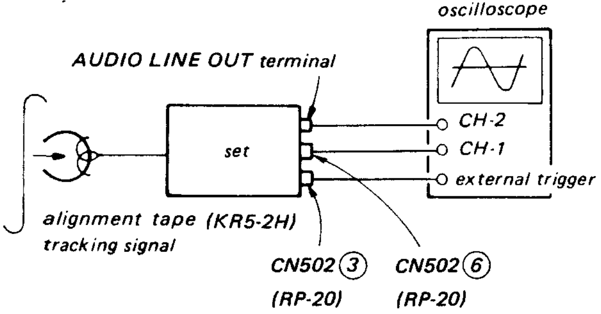
6) Turn the No. 7 guide nut clockwise to flatten the waveform.
7) Turn the No. 8 guide nut clockwise to line the No. 8 guide up with the tape (lower it so that there is no curl just before the waveform starts to change).
8) If the radio frequency waveform is as shown in Fig. 4-12 on the exit side, repeat the adjustment.

4-2-2. CTL Head (ACE Assembly) Position Adjustment

This adjustment includes the mechanical CTL head mounting position adjustment and the electrical tracking control center adjustment. The tracking control center adjustment is to be performed first, followed by the mechanical adjustment of the head mounting position.

[Connections]

1) Playback


oscilloscope
AUDIO LINE OUT terminal
set
CH-2
CH-1
external trigger
alignment tape (KR5-2H)
tracking signal
CN502③
(RP-20)
CN502⑥
(RP-20)

[Method of adjustment]

1) Play the tracking signal section of the alignment tape.
2) Turn the tracking control knob clockwise or counterclockwise to the center click position. Confirm that the amplitude of the radio frequency output signal is at its maximum level. Also confirm that the audio signal 0 level position occurs at the location of the channel B waveform. If the necessary standards are not met follow the procedure in 3).

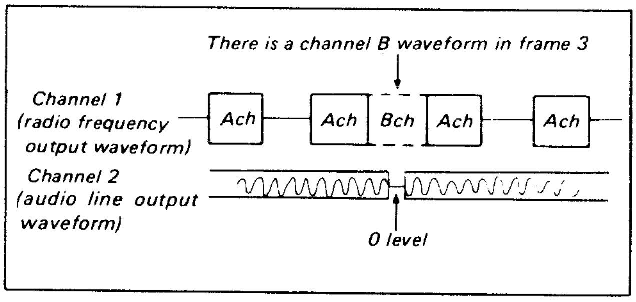

There is a channel B waveform in frame 3
Channel 1 (radio frequency output waveform)
Ach
Ach
Bch
Ach
Ach
Channel 2 (audio line output waveform)
0 level

Fig. 4-14.

3) Tracking center adjustment
   Refer to electrical adjustment 3) in section 5-3-2.
4) CTL head position adjustment
   a. Set the tracking control knob at the center click position.
   b. Loosen the 2 ACE assembly position adjustment screws, then use a tool such as an ordinary screwdriver to slide the ACE assembly to where the radio frequency output waveform amplitude becomes a maximum.
   c. Play the color bar signal on the alignment tape and check the picture quality.
   d. Tighten the position adjustment screws, then lock them.

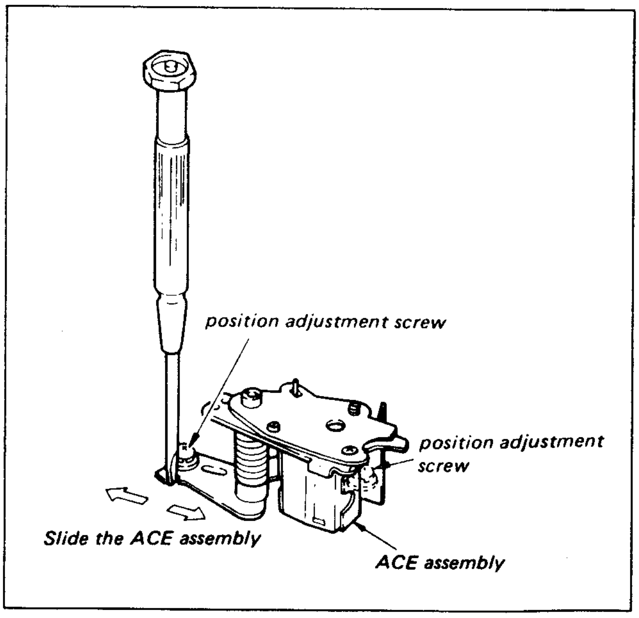
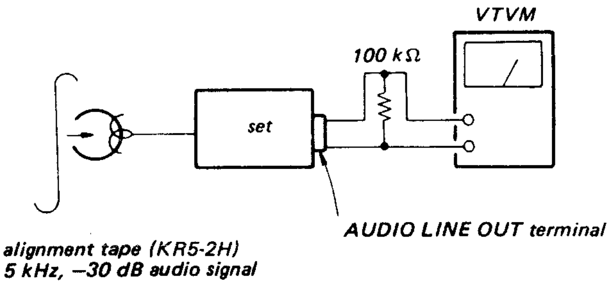

position adjustment screw
position adjustment screw
Slide the ACE assembly
ACE assembly

Fig. 4-15.

4-2-3. Audio head (ACE Assembly) Azimuth Adjustment

[Connections]

1) Playback


VTVM
100 kΩ
set
AUDIO LINE OUT terminal
alignment tape (KR5-2H)
5 kHz, −30 dB audio signal

[Method of adjustment]

1) Play the 5kHz. −30dB audio signal section (RF sweep section) of the alignment tape.
2) Adjust the azimuth adjustment screw until the output level (VTVM indication) is a maximum.
   Note:
   Complete the adjustment by turning the adjustment screw in the direction of tightening (clockwise).
3) After adjustment, lock the adjustment screw.

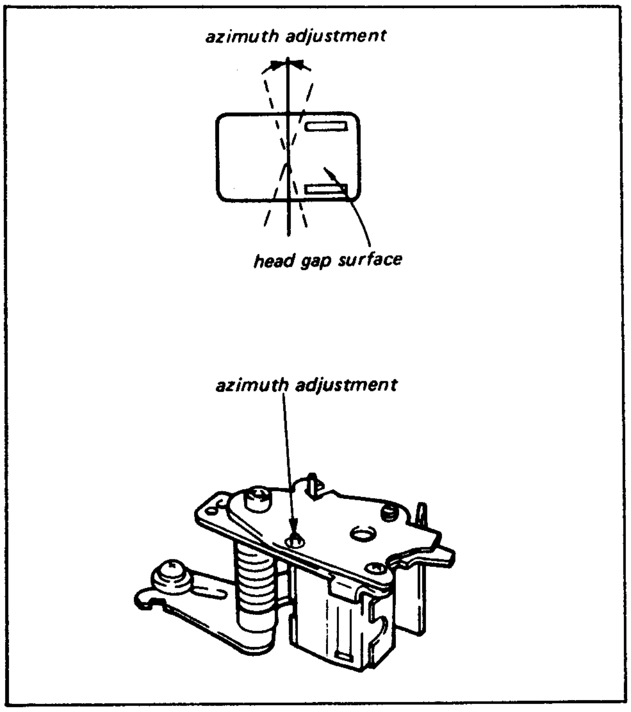

azimuth adjustment
head gap surface
azimuth adjustment

Fig. 4-16.

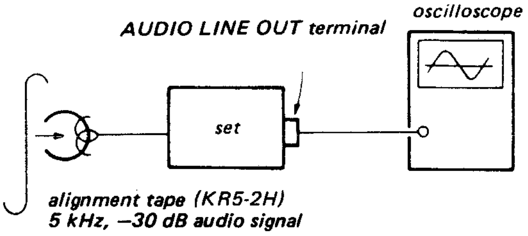
4-2-4. Audio Head (ACE Assembly) Height Adjustment

[Condition]

This adjustment must only be performed after the exit side tracking adjustment has been completed.

[Connections]

1) Playback


oscilloscope
AUDIO LINE OUT terminal
set
alignment tape (KR5-2H)
5 kHz, −30 dB audio signal

[Method of adjustment]

1) Play the 5kHz. −30dB audio signal section (RF sweep section) of the alignment tape.
2) Adjust the height adjustment nut so that the amplitude of the audio line output waveform (5 kHz) becomes a maximum.

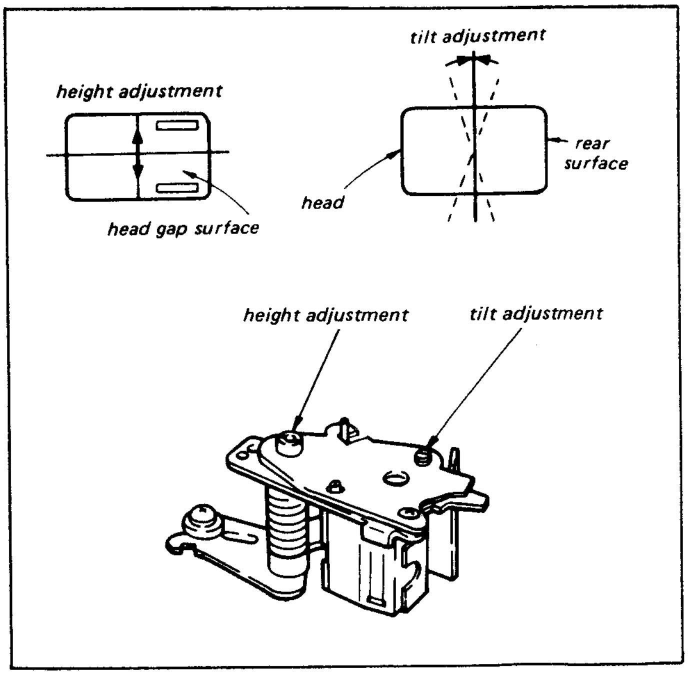

tilt adjustment
height adjustment
rear surface
head
head gap surface
height adjustment
tilt adjustment

Fig. 4-17.

4-3. HOW TO INSPECT THE TAPE TRAVELING WHEN ADJUSTING THE TAPE PATH

Adjust and check the tape path using the alignment tape following the adjustment guide, then check the tape travel using the procedure below.

1) Get one L-830 reel ready (these are widely available commercially). Remove the cassette cover referring to Fig. 4-1 of the adjustment guide.
2) Run the L-830 tape in playback mode and check the following points.
   i) Entrance side
   Confirm that the tape contacts the upper flange of the No. 5 and No. 6 guides and the lower flange of the No. 4 guide, and is not damaged or bent. (Some tape curl is allowed but the tape must not be creased.) (Fig. 4-18)
   ii) Exit side
   Confirm that the tape does not contact the upper flange of the No. 7 guide or the No. 8 guide, or the upper or lower flange of the No. 10 guide, and is not scratched. (Some tape curl is allowed but the tape must not be creased.) (Fig. 4-19)
   iii) If the tape was found to not be running correctly in step ii), readjust the tape path using the alignment tape, following the adjustment guide.
   If the tape is not running correctly on the entrance side, refer to section 4-12 of the adjustment guide.
   If the tape is not running correctly on the exit side, refer to section 4-1-3 of the adjustment guide.

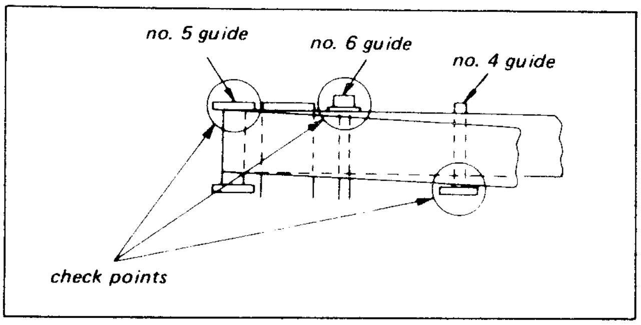


Fig. 4-18.

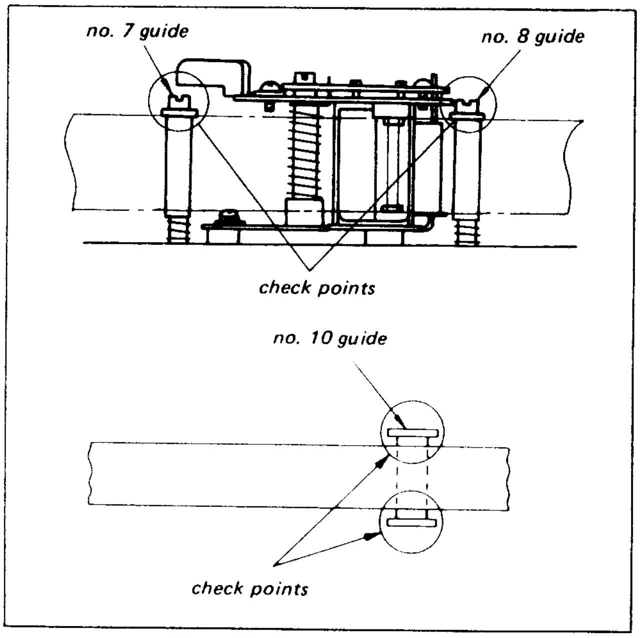


Fig. 4-19.

5. ELECTRICAL ALIGNMENT

All the electrical alignment can be performed by using the equipment mentioned below, the alignment tape, and the PAL colour bar signal (100%).

[Equipment Required]

(1) PAL Colour Monitor TV
(2) Oscilloscope, Dual-trace, Bandwidth . . . more than 10 MHz with delay mode
(3) Frequency Counter
(4) PAL Colour-Bar Generator
(5) Digital voltmeter
(6) Audio Signal Generator
(7) Audio level meter (VTVM)
(8) Attenuator
(9) Alignment Tape, type: KR5-2H, Code No. 8-969-995-52
(10) Alignment Tool (Adjusting screwdriver for semi-fixed resistors and coils)
Jig No. SL-0001, Code No. J-6080-001-A

[Setup for Alignment]

The antenna should be connected correctly to the antenna input terminal of the videocassette recorder.

It is important that the video output signal satisfies the specification because the telecast signal received by the incorporated tuner of the videocassette recorder is utilized as the adjustment signal of the machine. The incorporated tuner should be set to the channel with the best reception. The video signal should be checked with an oscilloscope connected to VIDEO OUT (BNC connector). Verify that the sync signal amplitude is approx. 0.3 Vp-p and the video signal amplitude is approx. 0.7 Vp-p at peak. Adjust the fine tuning while observing the signal and the TV screen so that the burst signal amplitude becomes approx. 0.3V ± 0.1 Vp-p. Also confirm that there is not spikes observed at the sync signal portion. (See Fig. 5-1.)

The video (colour bar) signal for the alignment is shown in Fig. 5-1.

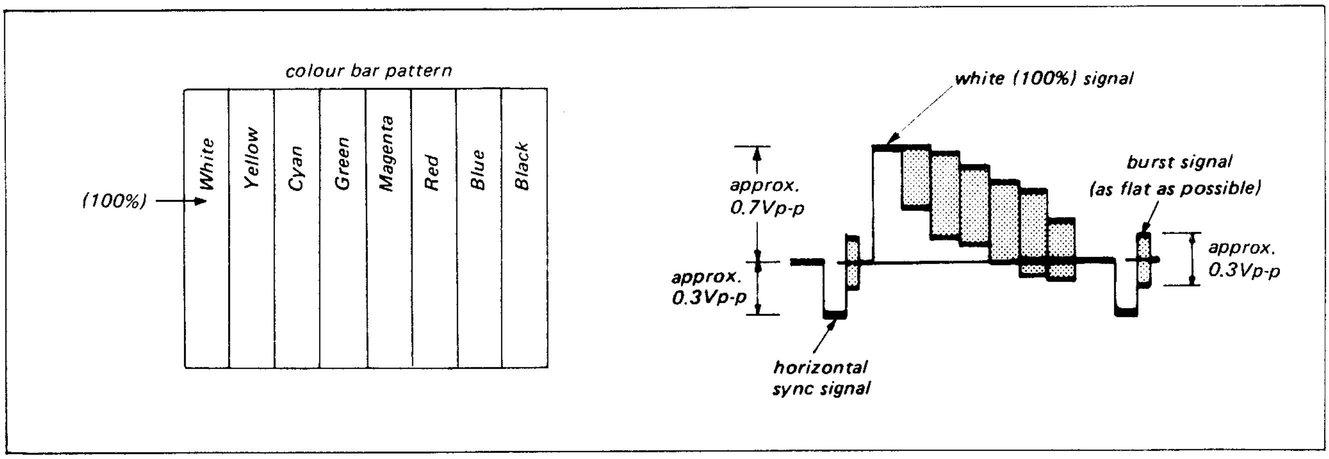


Fig. 5-1. Video (colour-bar) signal

[Alignment Tape]

KR5-2H

	Video signal	Audio signal	Playing time	Use for
1.	Colour bars	3 kHz - 5 dB	5 min	General performance, tape speed checks, switching position adjustment.
2.	Monoscope	333 Hz - 25 dB	5 min	Video head dihedral, audio level adjustment.
3.	RF sweep	5 kHz - 25 dB	5 min	Video, audio frequency characteristics, audio azimuth adjustment marker: 1, 2, 3.58, 4.5, 5.2 MHz
4.	Tracking 1 MHz (CH-B) *1 (Channel B is inserted in every 3 frames.)	1 kHz - 5 dB *2 (Signal is dropped out in the positions where channel B is inserted.)	5 min	Tracking, Audio height adjustments CTL Position check (Check if *1 and *2 are the same position.)

[Alignment Tool for Semi-fixed Variable Resistors and Coils]
Semi-fixed variable resistors and inductances should be adjusted with the alignment tool exclusively prepared for the adjustment of the components. A common screwdriver is too large for adjusting the components from the conductor side of a printed circuit board.

The metal blade of the alignment tool is used for variable resistors and trimmer capacitors and the plastic tip is used for variable inductances.

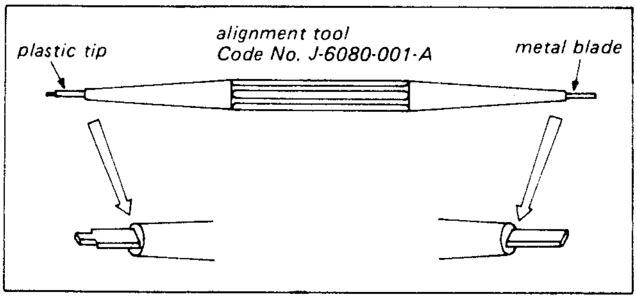

alignment tool
Code No. J-6080-001-A
plastic tip
metal blade

Fig. 5-2. Alignment tool

[Required levels and Impedances of Input and Output]

Video

Input VIDEO IN: BNC connector
$1\ \mathrm{Vp\text{-}p}\ ^{+1.0}_{-0.5}\ \mathrm{Vp\text{-}p}$
75Ω unbalanced, sync negative
VIDEO OUT: BNC connector
1 Vp-p ± 0.1 Vp-p
75Ω unbalanced, sync negative

Audio

Input AUDIO IN: phono jack
47 kΩ, −10 dBs
(0 dBs = 0.775V rms)
Output AUDIO OUT: phono jack
Load impedance less than 10 kΩ
−10 dBs with 47 kΩ load unbalanced

[Colour Bar Signal]
The 100% colour bar signal recorded on the Alignment tape is shown in Fig. 5-3.

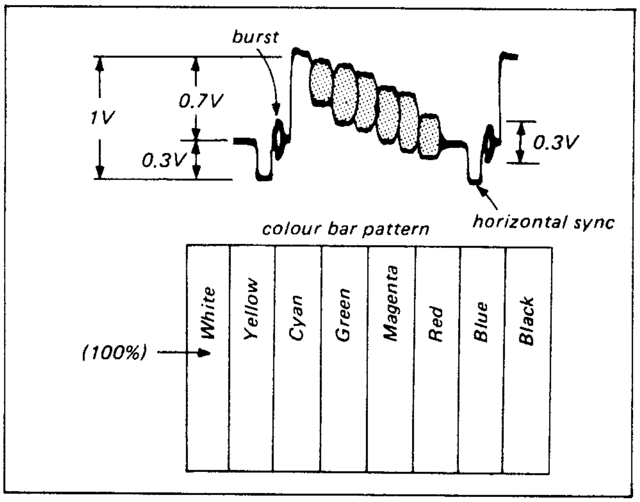
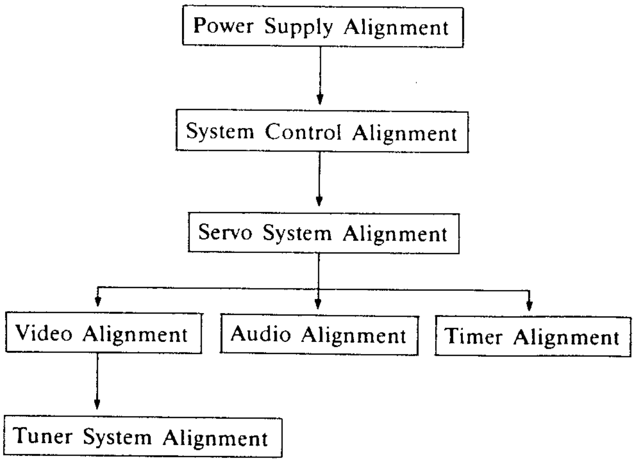

burst
1V
0.7V
0.3V
0.3V
colour bar pattern
horizontal sync
(100%)
White
Yellow
Cyan
Green
Magenta
Red
Blue
Black

Fig. 5-3. Colour bar signal recorded on the alignment tape

[Adjustment procedure]
Adjust in the order given below.


Power Supply Alignment
System Control Alignment
Servo System Alignment
Video Alignment
Audio Alignment
Timer Alignment
Tuner System Alignment

5-1. POWER SUPPLY CHECK (PS-67 Board)

Measure in E-E mode (power supply switch ON).

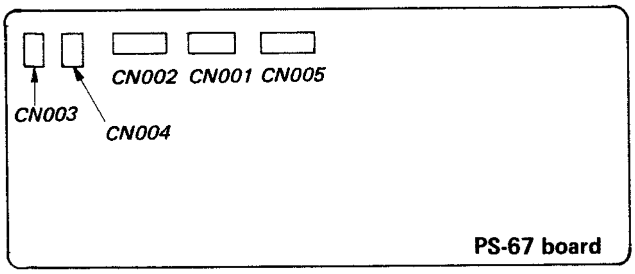


Fig. 5-4. Component layout

1. UN 12V Check
   Pin ⑥ of CN002 shall be 12 ±0.5V.
2. SW 12V Check
   Pin ① of CN001 shall be 12.2 ±0.2V.
   Pin ③ of CN002 shall be 12.2 ±0.2V.
3. SW 9V Check
   Pin ⑤ of CN002 shall be 9.0 ±0.2V.
4. UN 5V Check
   Pin ④ of CN001 shall be 5.0 ±0.5V.
5. UN 39V Check
   Pin ② of CN001 shall be 39 ±2V.
6. UN −39V Check
   Pin ③ of CN001 shall be −39 ±2V.

5-2. SYSTEM CONTROL CHECK (SS-34 Board)

1. **Clock Frequency Check**
   Mode: E-E
   Signal: None
   Frequency counter: Pin (60) of IC601
   Check: f: 6 MHz

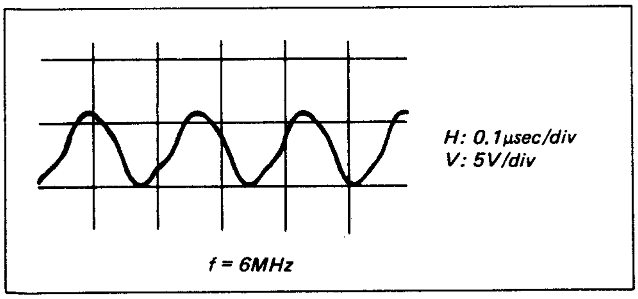


Fig. 5-5.

5-3. SERVO SYSTEM ALIGNMENT

Alignment Sequence
1. Drum servo system alignment
2. Capstan servo system alignment

5-3-1. Drum Servo System Alignment

1) Drum Free Speed Adjustment (SS-34 Board)
   Mode: Playback
   Signal: Alignment tape colour bar, or monoscope
   Oscilloscope: CH-1 TP405 (Pin ⑬ of IC301)
   CH-2 TP402 (Pin ㊴ of IC301)

[Alignment method]

Adjust to 553 µsec ± 10 µsec with RV303.

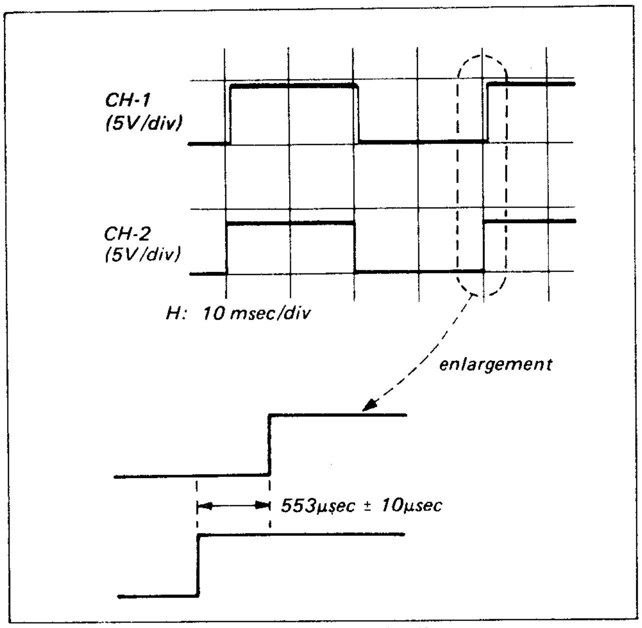


Fig. 5-6. Drum free speed adjustment

2) RF Switching Position Adjustment (SS-34 Board)
   Mode: Playback
   Signal: Alignment tape colour bar or monoscope
   Oscilloscope: CH-1 TP402 (Pin ㊴ of IC301)
   CH-2 Pin ㊵ of IC301

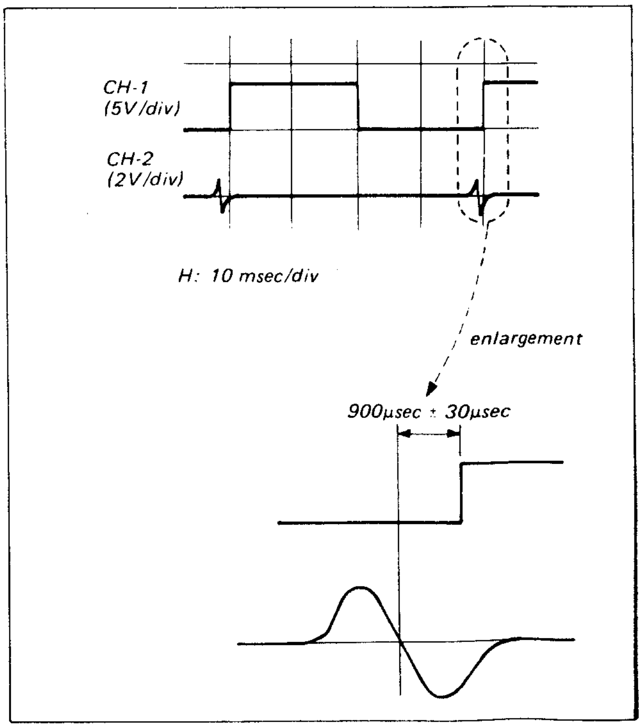


Fig. 5-7. RF switching position adjustment (1)

[Adjustment method]

i) Adjust to 900 µsec ± 30 µsec with RV304(See Fig. 5-7.)

ii) Change connection of CH-2 only to Pin ㉜ of IC301.

iii) Adjust to 900 µsec ± 30 µsec with RV305 (See Fig. 5-8.)

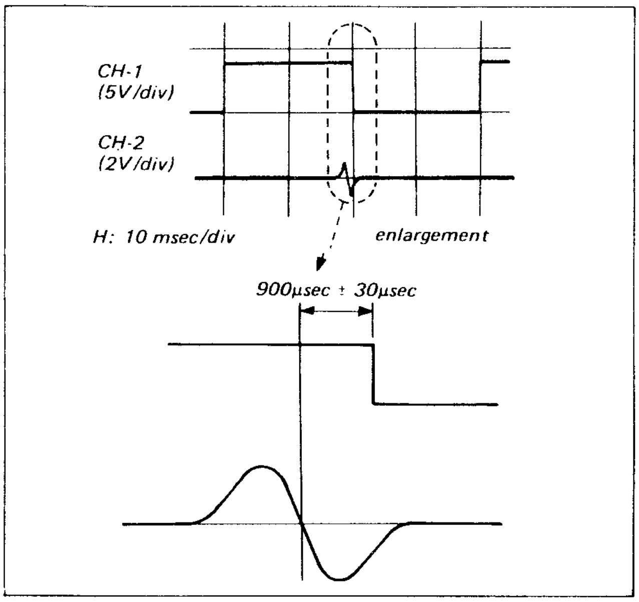

CH-1
(5V/div)
CH-2
(2V/div)
H: 10 msec/div
enlargement
900µsec ± 30µsec

Fig. 5-8. RF switching position adjustment (2)

3) PICTURE SEARCH, f_H Adjustment (SS-34 Board)
Mode: PICTURE SEARCH (FWD)
Signal: Alignment tape colour bar or monoscope
Frequency counter: Pin ③ of CN309 (TP404)

[Adjustment method]

Adjust to 64 µsec ± 0.3 µsec with RV307.

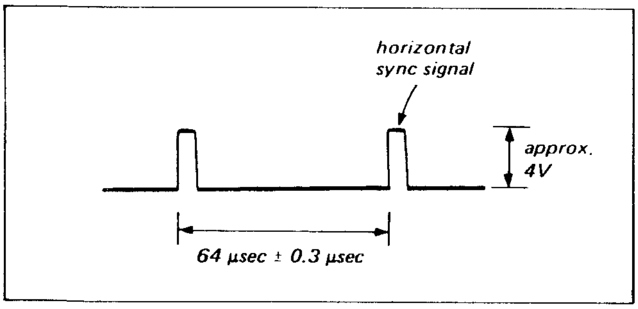

horizontal
sync signal
approx.
4V
64 µsec ± 0.3 µsec

Fig. 5-9. PICTURE SEARCH, drum free speed adjustment

5-3-2. Capstan Servo System Alignment

1) Capstan Free Speed Adjustment (SS-34 Board)
Mode: playback
Signal: Alignment tape colour bar or monoscope
Oscilloscope: TP407 (Pin ⑳ of IC301)

[Adjustment method]

Adjust the duty (ratio for A and B) to 50% ± 5% with the RV301.

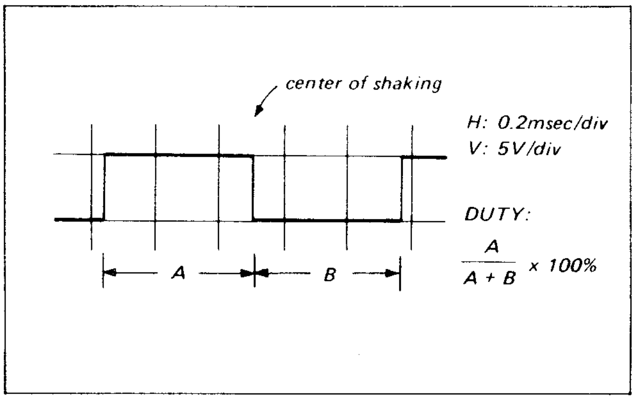

center of shaking
H: 0.2msec/div
V: 5V/div
DUTY:
$\frac{A}{A+B}$ x 100%
A
B

Fig. 5-10. Capstan free speed adjustment

2) PICTURE SEARCH, Capstan Free Speed Adjustment (SS-34 Board)
Mode: PICTURE SEARCH (FWD)
Signal: Alignment tape colour bar or monoscope

[Adjustment method]

i) Set up the picture search (forward) mode and adjust with RV302 so that the progression of noise bars becomes as slow as possible.

ii) Set up the picture search (reverse) mode and check that noise bars do not progress very quickly.

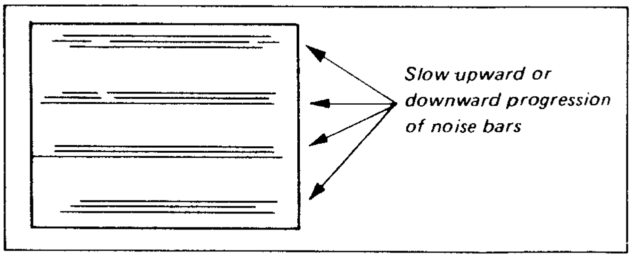

Slow upward or
downward progression
of noise bars

Fig. 5-11. PICTURE SEARCH, capstan free speed adjustment

3) Tracking Center Adjustment (SS-34 Board)
Mode: Playback
Signal: Alignment tape colour bar, or monoscope
Oscilloscope: CH-1 TP405 (Pin ⑬ of IC301)
CH-2 TP406 (Pin ⑮ of IC301)

[Adjustment method]

i) Set the TRACKING knob to the center click position.

ii) Adjust to 7.05 msec ± 0.05 msec with RV306.(See Fig. 5-12.)

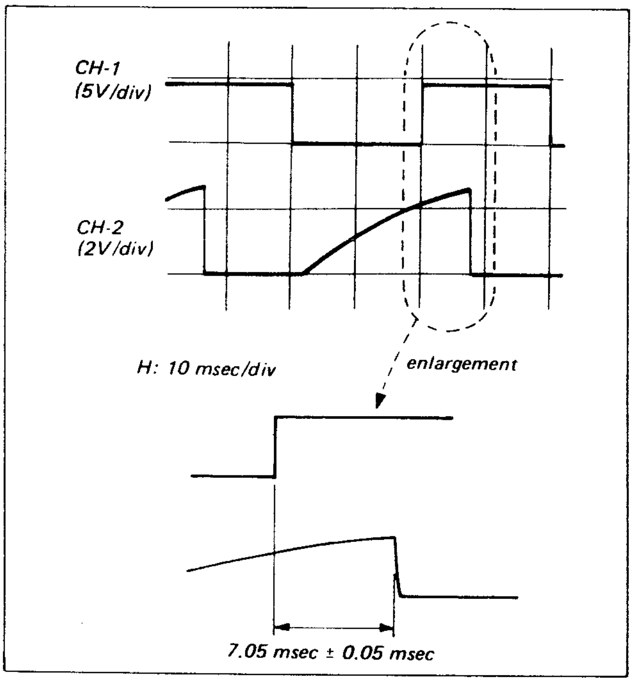

CH-1
(5V/div)
CH-2
(2V/div)
H: 10 msec/div
enlargement
7.05 msec ± 0.05 msec

Fig. 5-12. Tracking center adjustment

5-4. PAL VIDEO SYSTEM ALIGNMENT

As a rule, first the playback system is aligned with an alignment tape to check that it operates normally, then the recording system is aligned.
The alignment sequence is shown below. The Y signal and chroma signal systems are aligned for both playback and recording systems.
Colour video signal supplied by the PAL colour bar generator is used as video input signal for video system alignment in the record mode. Check that the sync and colour burst signals conform to the specifications designated in "Set-up for Alignment" in Fig. 5-1.

5-4-1. Playback System Alignment

1. Playback frequency characteristic adjustment
2. Expand adjustment
3. Playback video level adjustment
4. Y-comb adjustment
5. Dropout compensator adjustment
6. AFC adjustment
7. AFC offset adjustment
8. 4.43MHz REF adjustment
9. Chroma comb filter adjustment
10. Carrier balance adjustment
11. JOG PLL adjustment
12. JOG exchange chroma level adjustment

5-4-2. Record System Alignment

1. Sync AGC adjustment
2. Compress adjustment
3. Carrier set adjustment
4. Deviation adjustment
5. Dark clip and white clip adjustment
6. Y record current adjustment
7. Pilot burst signal level adjustment
8. Chroma record current adjustment

5-4-1. Playback System Alignment

1) Playback Frequency Characteristic Adjustment (RP-20 Board)
   - Adjust both the A and B channels.
   - The B channel indicated by ( ).

   Mode: Playback
   Signal: Alignment tape RF sweep
   Oscilloscope: Pin ⑥ of CN502
   External trigger: Pin ③ of CN502

[Adjustment method]

i) Turn tracking knob to maximum output.
ii) Adjust RV503 to make the 2MHz amplitude of A and B channels equal. (See Fig. 5-16)
iii) Set the trigger slope to –(+).
iv) Adjust the 5.2MHz amplitude to 1/2 – 2/3 of the 2MHz amplitude with RV502 (RV501).

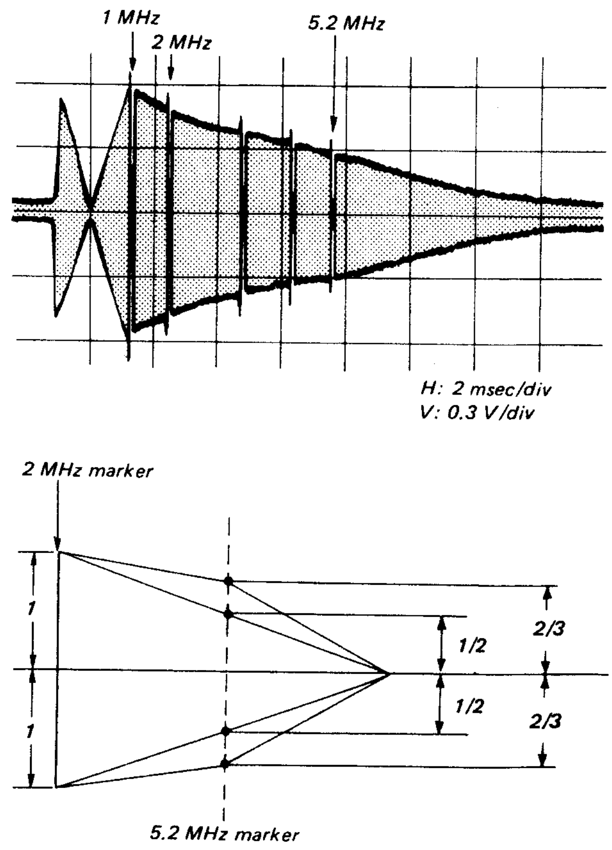


Fig. 5-16. Playback amplifier frequency characteristic adjustment

2) Expand Adjustment (YC-31 Board)
   Mode: Playback
   Signal: Colour bar
   Digital voltmeter: See Fig. 5-17.

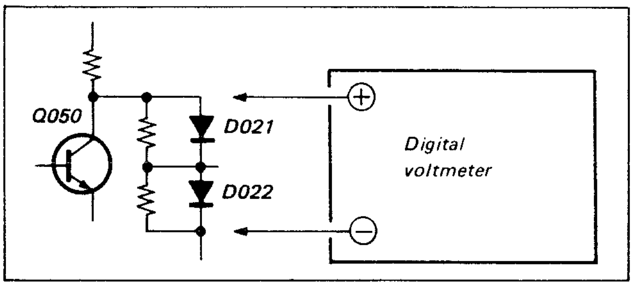


Fig. 5-17.

[Adjustment method]

i) Adjust to 0.45 ± 0.01 Vdc with RV020.

3) Playback Video Level Adjustment (YC-31 Board)
Mode: Playback
Signal: Alignment tape colour bar
Oscilloscope: VIDEO OUT (75Ω terminated) on YC-31 Board

[Adjusment method]

i) Adjust to 1.0V ± 0.05Vp-p with RV019 on YC-31 Board.

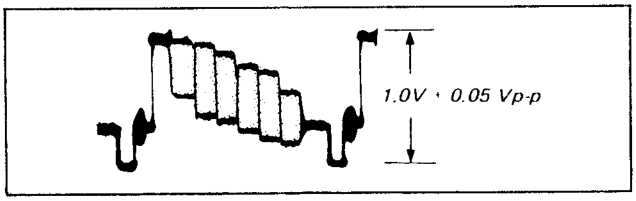


Fig. 5-18. Playback video level adjustment

4) Y-Comb Adjustment (YC-31 Board)
Mode: Playback
Signal: Colour bar
Oscilloscope: Pin ⑧ of IC401 (Attach 100kΩ resistor to tip of probe (10:1)).

[Adjustment method]

i) Adjust RV401 for minimum output.

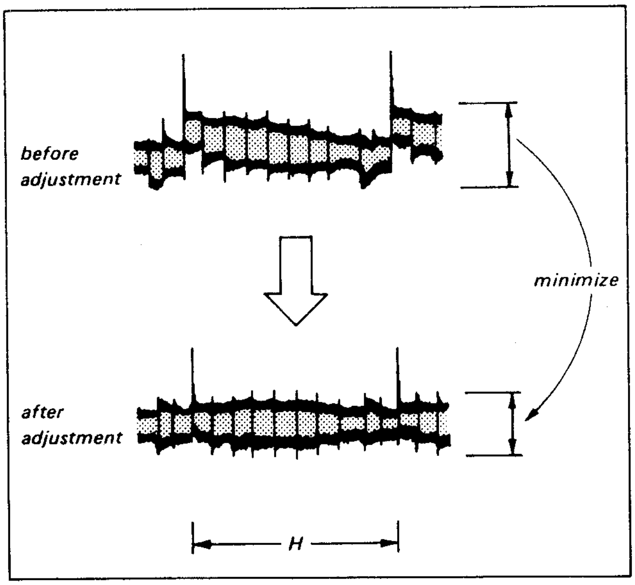


Fig. 5-19. Y-comb adjustment

5) Dropout Compensator Threshold Adjustment (YC-31 Board)
Mode: Playback
Signal: A recorded tape with dropouts

[Adjustment method]

i) Turn RV010 fully clockwise (↻) as seen from the pattern side. In this state, dropouts appear on the monitor screen.
ii) Slowly turn RV010 counterclockwise (↺) and set to make the dropouts disappear.
iii) Rewind the tape and verify that the dropouts described in (i) above have disappeared.

6) AFC Adjustment (YC-31 Board)
Mode: E-E
Signal: Colour bar
Oscilloscope: Pin ㉖ of IC006

[Adjustment method]

i) Adjust to 4.50Vdc ± 0.01 Vdc with RV007.

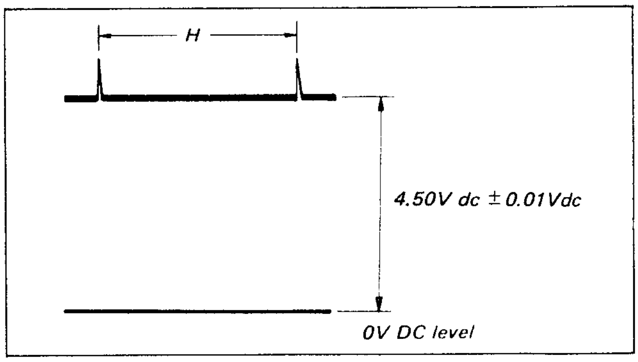


Fig. 5-20. AFC adjustment

7) AFC Offset Adjustment (YC-31 Board)
Mode: Record
Signal: Colour bar
Oscilloscope: Pin ㉖ of IC006

[Adjustment method]

i) Adjust RV006 so that the fluctuation of DC level is minimum.
ii) After this adjustment, check the AFC adjustment.

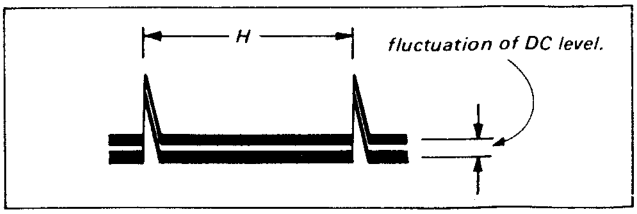


Fig. 5-21. AFC offest adjustment

8) 4.43MHz REF. adjustment (YC-31 Board)
Mode: PB
Signal: Colour bar
Frequency counter: Pin ⑭ of IC006

[Adjustment method]

i) Adjust to 4.433619MHz ± 5 Hz with CV001.

9) Chroma Comb Filter Adjustment (YC-31 Board)
Mode: Playback
Signal: Alignment tape colour bar
Adjust while observing the monitor TV screen.

[Adjustment method]
i) Minimize beats with RV501 and LV501.

10) Carrier Balance Adjustment (YC-31 Board)
Mode: Playback
Signal: Alignment tape colour bar
Adjust while observing the monitor TV screen.

[Adjustment method]
i) Minimize beats with RV005.

11) JOG PLL Adjustment (YC-31 Board)
Mode: E-E
Signal: Colour bar
Oscilloscope: Pin ⑩ of IC003

[Adjustment method]
Adjust to 20μsec ±1μsec with RV003. (See Fig. 5-28.)

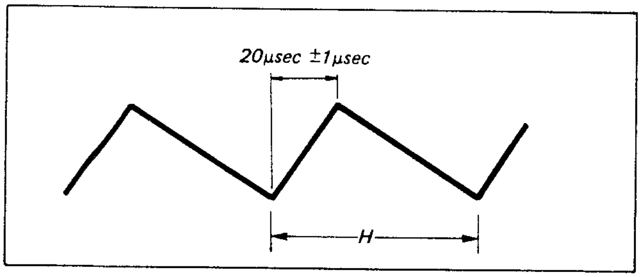


Fig. 5-22. JOG PLL adjustment

12) JOG Exchange Chroma level Adjustment (YC-31 Board)
Mode: PB • PAUSE (STILL)
Signal: colour bar
Oscilloscope: Pin ⑧ of IC003

[Adjustment method]
i) Adjust RV002 so that the fluctuation of level is minimum.

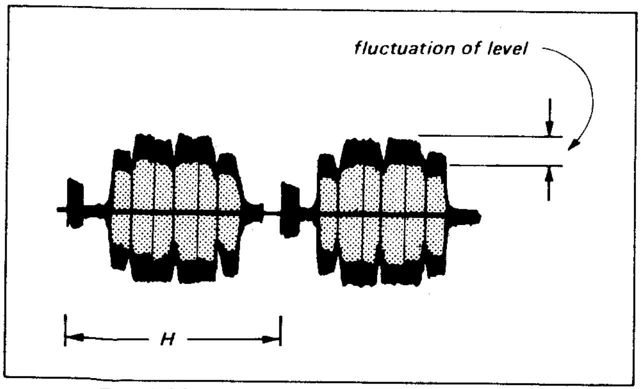


Fig. 5-23. JOG EXCH. C. level adjustment

5-4-2. Record System Alignment

1) Sync AGC Adjustment (YC-31 Board)
Mode: E-E
Oscilloscope: VIDEO OUT (75Ω terminated)
Signal: Colour bar (V : S = 7 : 3)

[Adjustment method]
i) Adjust to 1.0V ±0.05Vp-p with RV021.

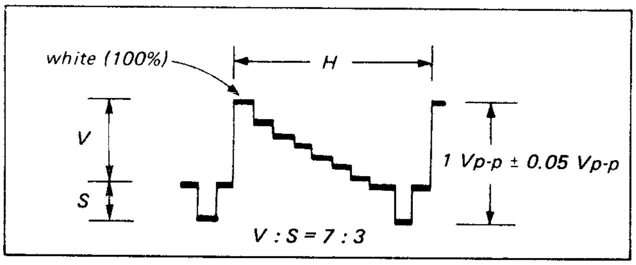


Fig. 5-24. Sync AGC adjustment

2) Compress Adjustment (YC-31 Board)
Mode: E-E
Signal: None
Digital voltmeter: See Fig. 5-25.

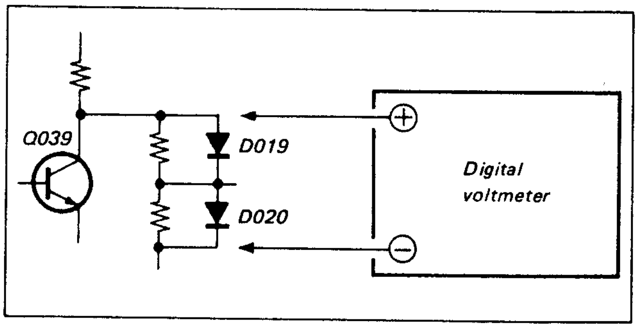


Fig. 5-25.

[Adjustment method]
i) Adjust to 0.3V ± 0.01 Vdc with RV016.

3) Carrier Set Adjustment (YC-31 Board)
Mode: E-E
Signal: None
Frequency counter: Pin ㉕ of IC009

[Adjustment method]
1) Adjust to 3.8MHz ±0.04MHz with RV014.

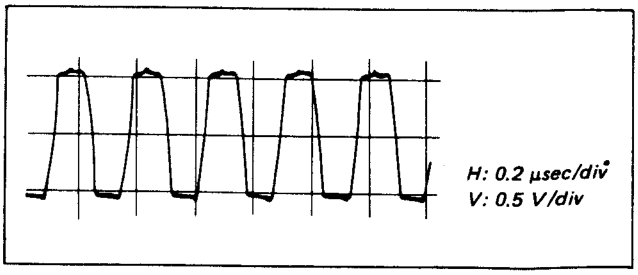


Fig. 5-26. Carrier set adjustment

4) Deviation Adjustment (YC-31 Board)

- The playback system adjustment and the carrier set adjustment in Paragraph 3) above must be completed before making this adjustment.

Mode: Self-recording and playback
Signal: Colour bar
Oscilloscope: Collector of Q038, VIDEO OUT (75Ω terminated)

[Adjustment method]

i) Supply the colour bar signal and set up E-E mode.
ii) Connect the oscilloscope to Collector of Q038.
iii) Adjust the Y signal level to 0.4Vp-p with RV015.
iv) Set up RECORD mode.
v) Playback the recorded section of the tape.
vi) Connect the oscilloscope to VIDEO OUT.
vii) Check that the video signal level is 1.0 Vp-p ± 0.05 Vp-p. if the level is outside of this range, repeat Steps iv) through vi) above adjusting with RV015 until the standard value is obtained.

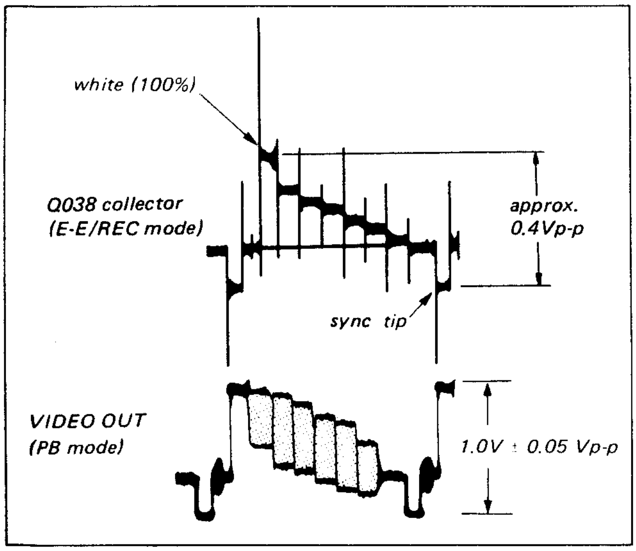


Fig. 5-27. Deviation adjustment

5) Dark Clip and White Clip Adjustment (YC-31 Board)

Mode: E-E
Signal: None
Frequency counter: Pin ㉕ of IC009

[Adjustment method]

i) Connect a jumper wire between the base of Q041 and ground.
ii) Adjust to 2.82MHz ±0.1MHz with RV012.
iii) Check that the voltage of the collector of Q038 is 1.5V ±0.3V dc.
iv) Remove the jumper wire.
v) Connect a jumper wire between the base of Q041 and the 9V line (collector of Q042).
vi) Adjust to 6.66MHz ±0.1MHz with RV013.
vii) Remove the jumper wire.

6) Y Record Current Adjustment(YC-31Board)

Mode: Record
Signal: Colour bar
Oscilloscope: Pin ⑤ of CN002

[Adjustment method]

i) Adjust to 450mV ±20mVp-p with RV602.

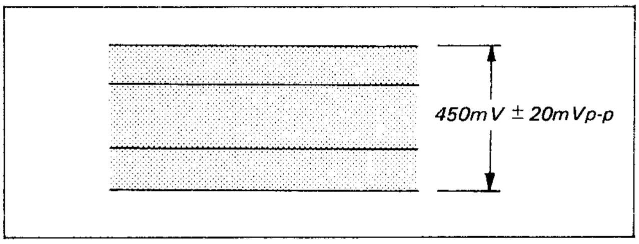


Fig. 5-28. Y record current adjustment

7) Pilot Burst Signal Level Adjustment (YC-31 Board)

Mode: E-E
Signal: Colour bar
Oscilloscope: Pin ① of IC006

[Adjustment method]

i) Align the pilot burst signal with the chroma signal level using RV009.

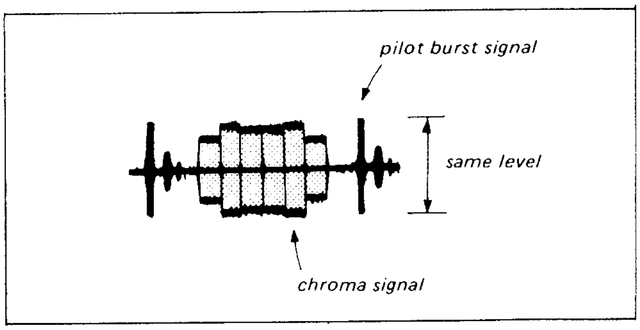


Fig. 5-29. Pilot burst signal level adjustment

8) Chroma Record Current Adjustment (YC-31 Board)

Mode: E-E
Signal: Colour bar
Oscilloscope: Pin ⑦ of CN002

[Adjustment method]

i) Adjust to 180mV ±10mVp-p with RV008.

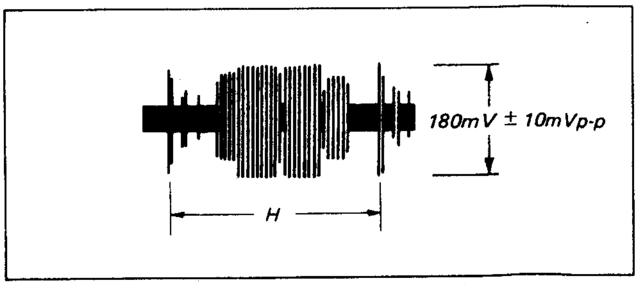


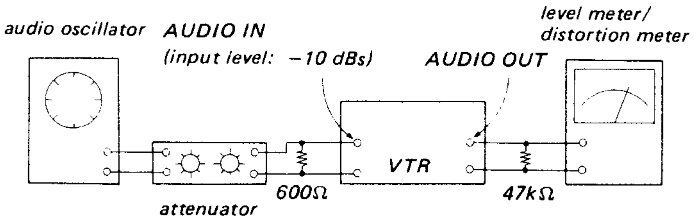
Fig. 5-30. Chroma record current adjustment

5-5. AUDIO SYSTEM ADJUSTMENT (TA-22 Board)

Use a Dynamicron tape for adjustments.

[Connection of Related Equipment]

Note: Set the INPUT SELECT switch to LINE.
Set the TONE switch to HIGH.



[Adjustment method]

1. ACE head adjustment . . . See "Mechanical Adjustment"
2. Playback frequency characteristic check
3. Playback output level adjustment
4. Bias oscillator check
5. Record bias adjustment
6. Record level check
7. Overall frequency characteristic check
8. Overall S/N check
9. Overall distortion check

1. ACE Head Adjustment

Refer to "Mechanical Adjustment"

2. Playback Frequency Characteristic Check

(1) Play back 333 Hz and 5 kHz from the alignment tape and check that the level difference between 333Hz and 5kHz is within 0dB ±1dB.

3. Playback Output Level Adjustment

(1) Play back 333 Hz from the alignment tape and adjust so that the output level is −30 dBs ± 0.5 dB with RV301.

4. Bias Oscillator Check

(1) Set the input signal level to zero and set up the RECORD mode.

(2) Connect a frequency counter to Pin ② of CN303. The reading should be 65kHz ±6.5kHz.

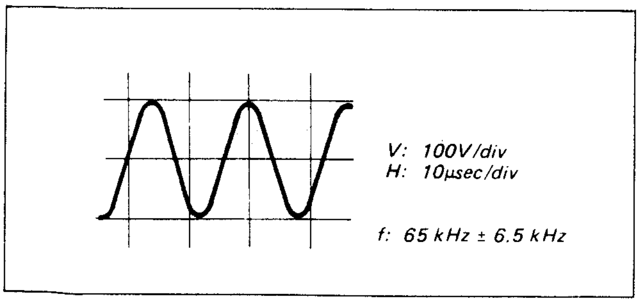


Fig. 5-31. Bias oscillator check

5. Record Bias Adjustment

Check that "Playback frequency characteristic check has been made.

(1) Connect TP301 and TP306 (GND) with a jumper wire so as to turn off the AGC operation.

(2) Supply a 333 Hz signal.

(3) Set up the E-E mode and adjust the oscillator output level so that the level meter reading is −30 dBs.

(4) Record signals.

(5) Supply a frequency of 7 kHz and perform Steps (3) and (4) above.

(6) Play back the recorded section of the tape and check that the output level at 7 kHz is ±1 dB relative to the output level at 333 Hz. If the level is outside this range, repeat Steps (2) through (5) adjusting with RV331 until the standard is met.

(7) Remove the jumper wire after making the adjustment.

6. Record Level Check

(1) Supply a 333Hz signal at −10dBs.

(2) Set up the E-E mode.

(3) Check that the output level is −10dBs ±3dB.

(4) Record signals.

(5) Play back the recorded section of the tape and check that the output level is −9dBs ±3dB.

7. Overall Frequency Characteristic Check

(1) Connect TP301 and TP306 (GND) with a jumper wire so as to turn off the AGC operation.

(2) Connect a 333 Hz signal.

(3) Set up the E-E mode and adjust the oscillator output level so that the level meter reading is −30 dBs.

(4) Record signals.

(5) Change the frequency to 50 Hz, 100 Hz, 7 kHz and 10 kHz and repeat Steps (3) and (4).

(6) Play back the recorded section of the tape and verify that the level is within the specification.

Standard values: With reference to the 333 Hz playback output level.

50 Hz $^{+2.5}_{-10}$ dB

100 Hz $^{+2.5}_{-3}$ dB

7 kHz $^{+2.5}_{-2.5}$ dB

10 kHz $^{+2.5}_{-6}$ dB

(7) If the specified values cannot be attained, perform 5 again. "Record Bias Adjustment".

(8) Remove the jumper wire after making the adjustment.

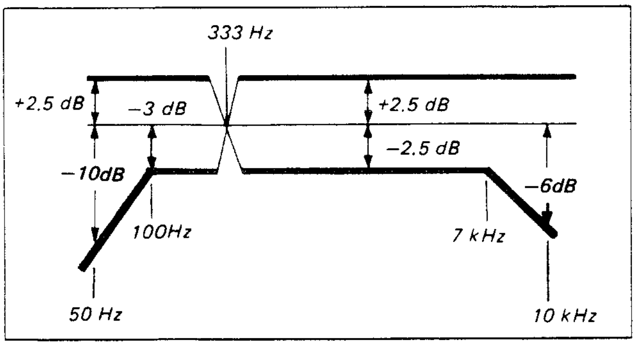


Fig. 5-32. Overall frequency characteristic

8. Overall S/N Check

(1) Supply a 333 Hz signal at −10 dBs.
(2) Record signals.
(3) Set the input signal level to zero and record signals.
(4) Play back the recorded section of the tape and check that the output level difference is greater than 38 dB.

9. Overall Distortion Check

(1) Supply a 333 Hz signal at −10 dBs.
(2) Record signals.
(3) Play back the recorded section of the tape and verify that the distortion is below 4%.

5-6. TUNER SYSTEM ADJUSTMENT (TA-22 Board)

1) Tuner AGC Adjustment

(1) Set the DX/LOCAL switch on the rear panel to DX.
(2) Input RF signals (West germany model: 52dBμ /75Ω terminated, other models: 55dBμ/75Ω terminated) from a colour bar generator, etc.
(3) Connect a digital voltmeter to TP001 (Pin ④ of IC001).
(4) Adjust RV001 to 7.2V ± 0.1V dc.

2) AFT Adjustment

(1) Input RF signals, and press FINE + or FINE − button finely for the best picture quality, while watching the monitor screen.
(2) Connect a digital voltmeter to pin ⑤ of IC001.
(3) Adjust T005 to 6V dc.
(4) Press AFT button to turn on the AFT operation, receive each channel and check to make sure that there is no beat or picture disturbance.

5-7. TIMER SYSTEM ADJUSTMENT (TM-57 Board)

1) Clock Adjustment

(1) Connect a frequency counter to pin (63) of IC001.
(2) Adjust oscillation period (T) with TC001 so the value will be as follows.

T = (30.51750 + 0.000015 x Cp)μsec ±0.0001μsec

Cp: Probe capacity (PF) of the frequency counter

2) System Clock Adjustment

(1) Connect a frequency counter to pin ㉖ of IC001.
(2) Adjust oscillation frequency (f) to the following value with RV001.

f = (2.60 − 0.0041 x Cp)MHz ±0.05MHz

Cp: Probe capacity (PF) of the frequency counter

5-8. SECAM VIDEO SYSTEM ALIGNMENT

- Make this adjustment after aligning the PAL video system.
- For this adjustment, use the equipment listed below in conjunction with an alignment tape and SECAM colour bar signals.

[Equipment Required]

(1) SECAM Colour Monitor TV
(2) Oscilloscope, Dual-trace, Bandwidth . . . more than 10 MHz with delay mode
(3) SECAM Colour-Bar Generator
(4) Alignment Tape, Type: KR5-1J, Code No. 8-969-996-03

[Setup for Alignment]

In this alignment, video signals obtained from the pattern generator will be used as alignment signals. Therefore, the video output signals should be within the specifications. Verify video signals by connecting an oscilloscope to VIDEO OUT connector (75Ω terminated). Check that the video signals are flat when the amplitude of the horizontal sync signal is about 0.3 Vp-p, the amplitude of the video portion is about 0.7 Vp-p, and the amplitude of the burst signal is about 0.3 Vp-p.
The video signal (colour-bar signal) used in this alignment is shown in Fig. 5-33.

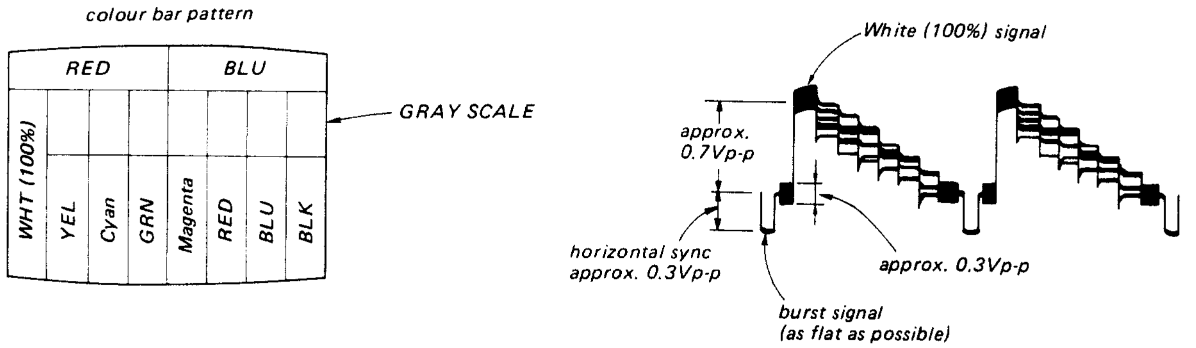

colour bar pattern
RED
BLU
GRAY SCALE
WHT (100%)
YEL
Cyan
GRN
Magenta
RED
BLU
BLK
White (100%) signal
approx. 0.7Vp-p
horizontal sync approx. 0.3Vp-p
approx. 0.3Vp-p
burst signal (as flat as possible)

Fig. 5-33. SECAM video (colour bar) signal

[Alignment Tape]
KR5-1 J

	Video signal	Audio signal	Playing time	Use for
1.	Colour bars	3 kHz – 5 dB	5 min	General performance, tape speed checks, switching position adjustment.
2.	Monoscope	333 Hz – 25 dB	5 min	Video head dihedral, audio level adjustment.
3.	RF sweep	5 kHz – 25 dB	5 min	Video, audio frequency characteristics, audio azimuth adjustment marker: 1, 2, 3.58, 4.5, 5.2 MHz
4.	Tracking 1 MHz (CH-A) *1 (Channel B is inserted in every 3 frames.)	1 kHz – 5 dB *2 (Signal is dropped out in the positions where channel B is inserted.)	5 min	Tracking, Audio height adjustments CTL Position check (Check if *1 and *2 are the same position.)

[Colour Bar Signal]

The 100% colour bar signal recorded on the Alignment tape is shown in Fig. 5-34.

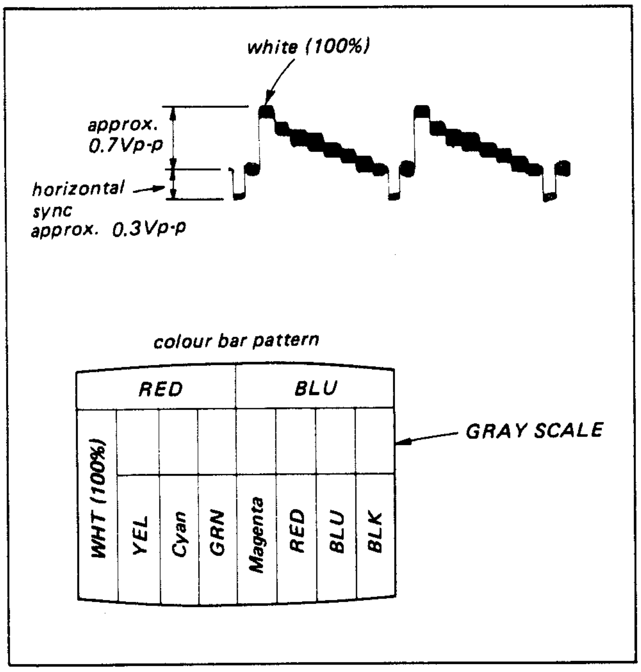

white (100%)
approx. 0.7Vp-p
horizontal sync approx. 0.3Vp-p
colour bar pattern
RED
BLU
GRAY SCALE
WHT (100%)
YEL
Cyan
GRN
Magenta
RED
BLU
BLK

Fig. 5-34. Colour bar signal recorded on the alignment tape

1) Bell Filter Adjustment (YC-31 Board)

Mode:	E-E
Signal:	SECAM colour bar
Oscilloscope:	Pin ⑦ of CN002

[Adjustment method]

i) Adjust LV003 until the waveform is flat.

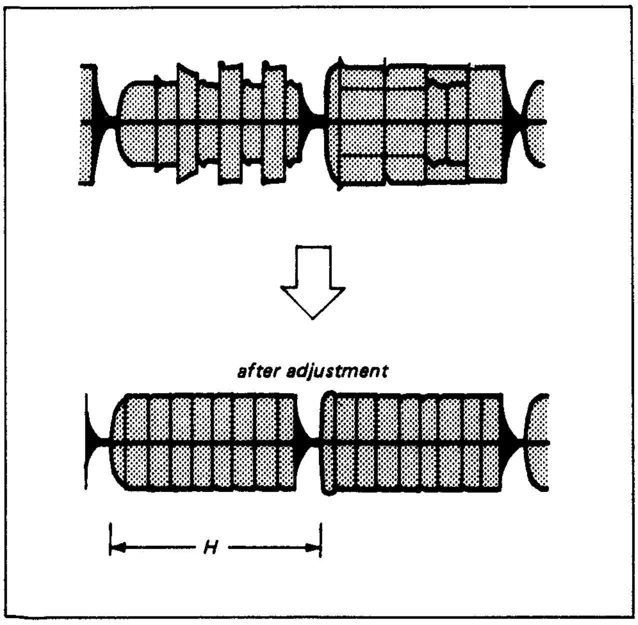

after adjustment
H

Fig. 5-35. Bell filter adjustment

2) SECAM ACK Adjustment (YC-31 Board)

Mode:	E-E
Signal:	SECAM colour bar
Oscilloscope:	Pin ⑨ of IC002

[Adjustment method]

i) Adjust LV001 until the amplitude is a maximum.

ii) Adjust RV001 to 4.0V ±0.2Vp-p.

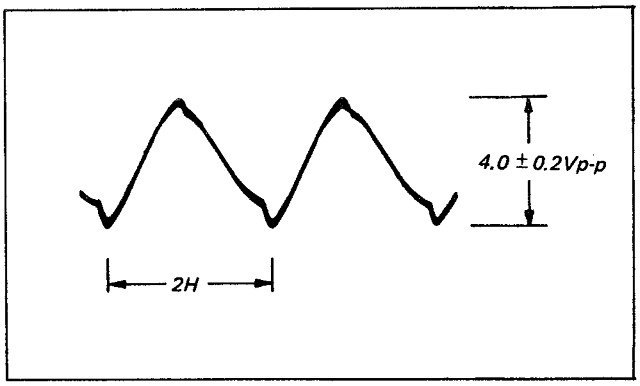


Fig. 5-36. SECAM ACK adjustment

3) Counter Bell Filter Adjustment (YC-31 Board)

Mode:	Self-recording and playback
Signal:	SECAM colour bar

Adjust while observing the monitor TV screen.

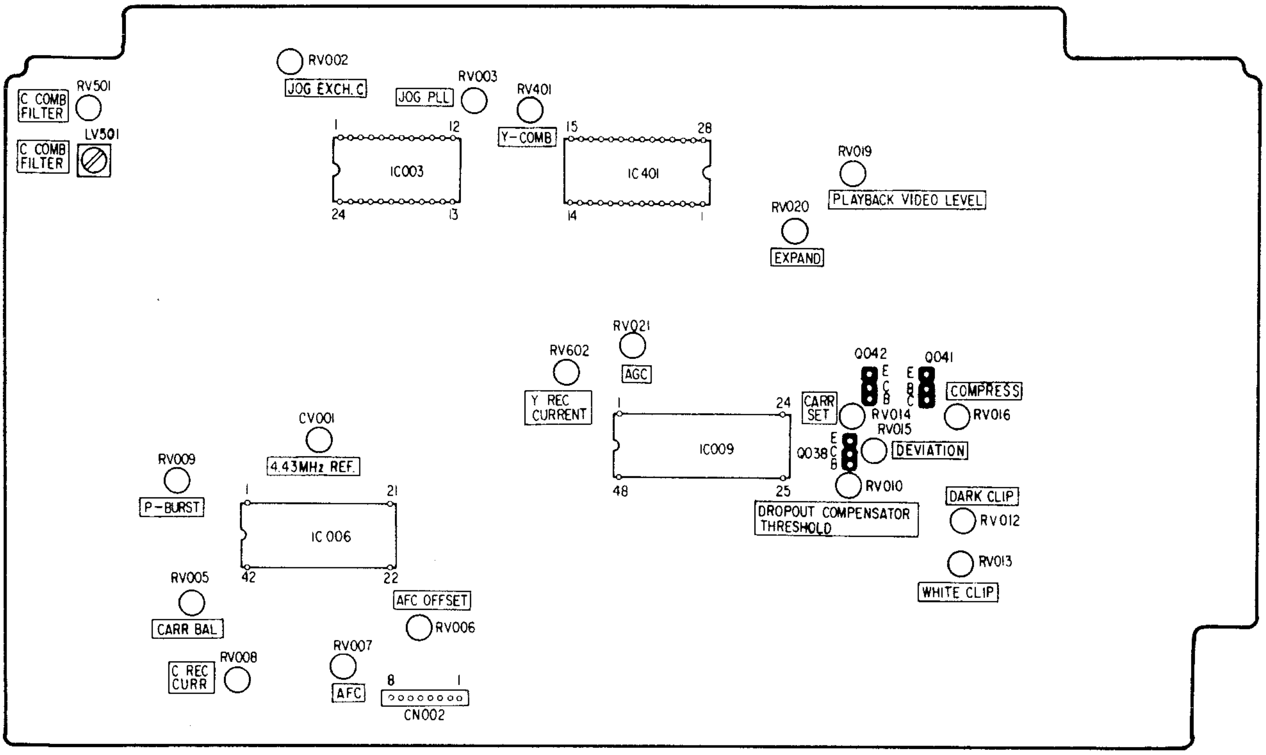
[Adjustment method]

i) Record SECAM colour bar signals.

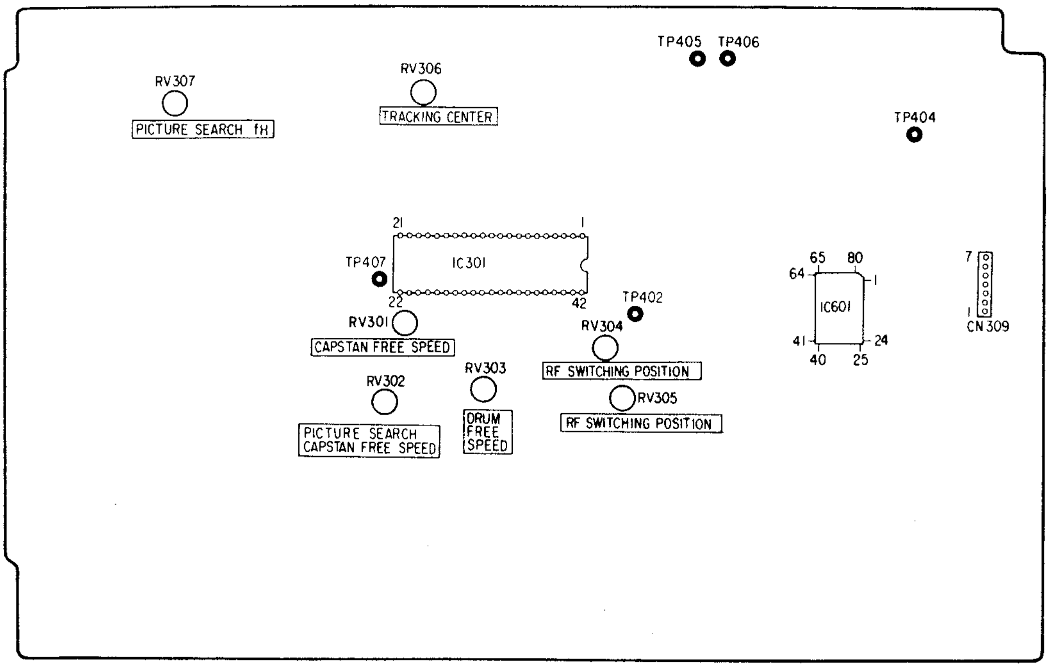
ii) Playback the recorded signals.

iii) While observing the monitor TV screen, adjust LV002. until the border between the red and blue areas is at its cleanest (minimum beats).

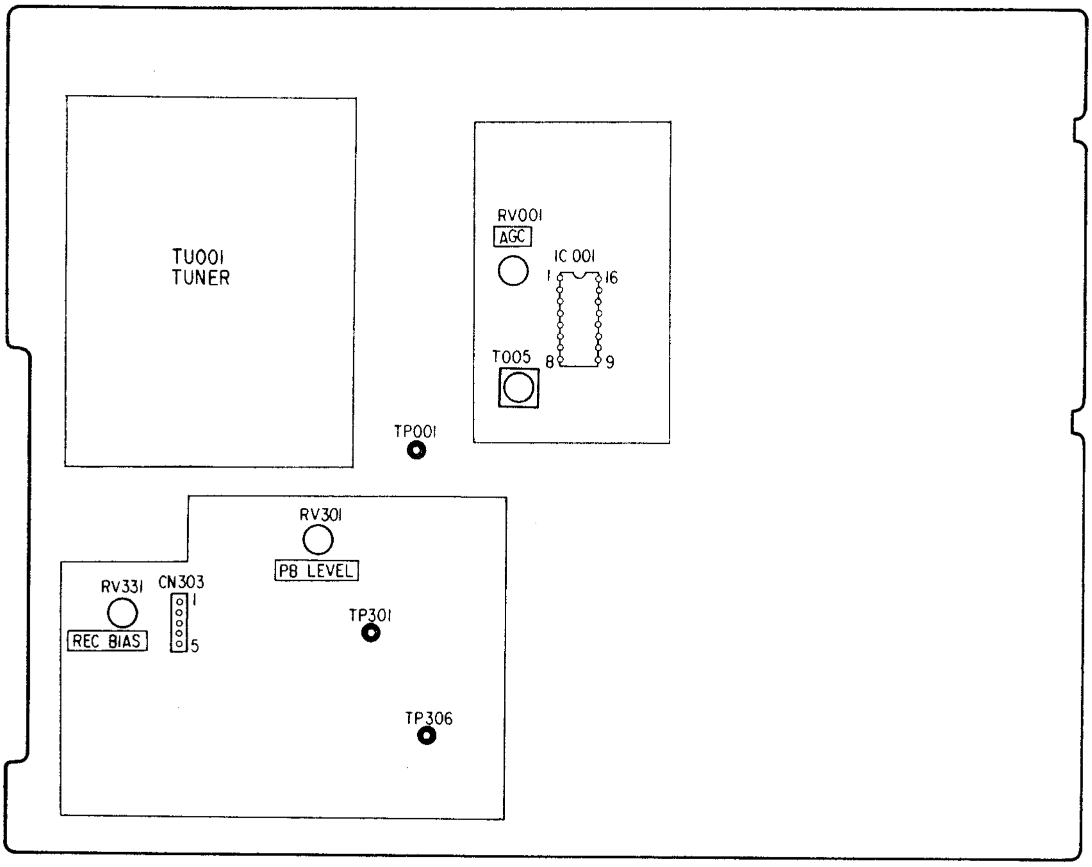
YC-31 BOARD (SOLDER SIDE)


RV002
JOG EXCH. C
RV003
JOG PLL
RV401
Y-COMB
C COMB FILTER
RV501
C COMB FILTER
LV501
IC003
IC401
RV019
PLAYBACK VIDEO LEVEL
RV020
EXPAND
RV021
AGC
RV602
Y REC CURRENT
Q042
Q041
COMPRESS
CARR SET
RV014
RV016
RV015
DEVIATION
IC009
Q038
RV010
DARK CLIP
RV012
DROPOUT COMPENSATOR THRESHOLD
RV013
WHITE CLIP
CV001
4.43MHz REF.
RV009
P-BURST
IC 006
RV005
CARR BAL
AFC OFFSET
RV006
RV007
AFC
RV008
C REC CURR
CN002

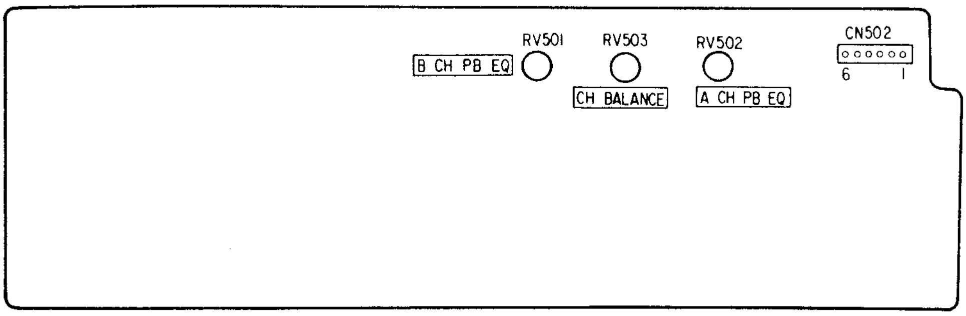
SS-34 BOARD (COMPONENT SIDE)


TP405
TP406
RV307
PICTURE SEARCH fH
RV306
TRACKING CENTER
TP404
IC301
TP407
TP402
RV301
CAPSTAN FREE SPEED
RV304
RF SWITCHING POSITION
RV302
RV303
PICTURE SEARCH CAPSTAN FREE SPEED
DRUM FREE SPEED
RV305
RF SWITCHING POSITION
IC601
CN309

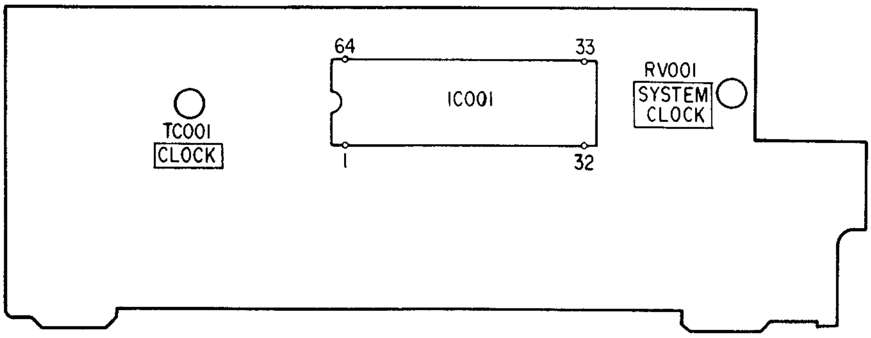
TA-22 BOARD (COMPONENT SIDE)


TU001
TUNER
RV001
AGC
IC 001
1
16
8
9
T005
TP001
RV301
PB LEVEL
RV331
CN303
1
5
REC BIAS
TP301
TP306

RP-20 BOARD (COMPONENT SIDE)

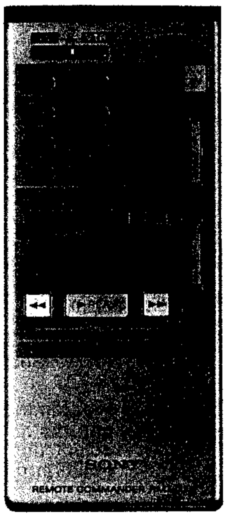

RV501
RV503
RV502
CN502
B CH PB EQ
CH BALANCE
A CH PB EQ
6
1

TM-57 BOARD (COMPONENT SIDE)


64
33
IC001
1
32
RV001
SYSTEM
CLOCK
TC001
CLOCK

RMT-234

SERVICE MANUAL

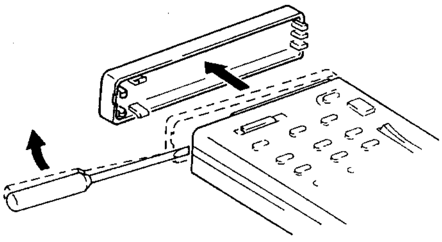


SPECIFICATIONS

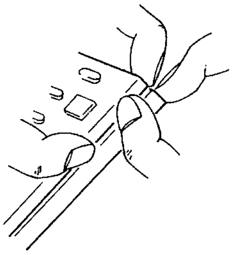
Remote Commander RMT-234

Remote control system	Infrared control
Power requirements	3V DC, 2 IEC designation R6 batteries (size AA)
Dimensions	Approx. 65 × 20 × 150 mm (w/h/d) (2$^5/_8$ × $^{13}/_{16}$ × 6 inches) incl. projecting parts and controls
Weight	Approx. 150 g (5 oz) incl. batteries

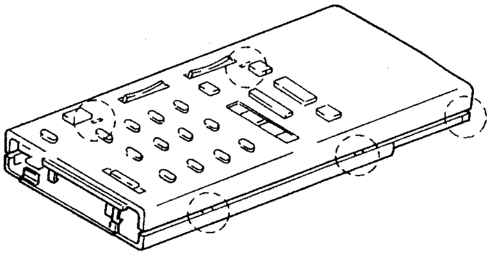
Disassembly



①
Remove the plate, frosted by prying up with a screwdriver.



②
While pulling the lower case outward, lift the upper case and free the claw.



③
Free all five claws similarly.

REMOTE COMMANDER

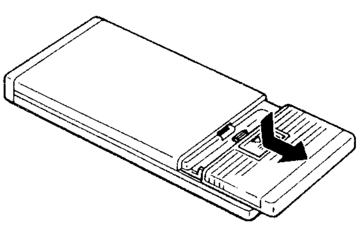
SONY®

1. REMOTE CONTROL OPERATION

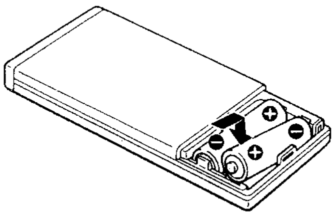
You can control almost all the functions of this video cassette recorder from your armchair using the supplied Remote Commander.

BATTERY INSERTION

1 Open the lid.



2 Insert two IEC designation R6 batterries with correct polarity.



3 Close the lid firmly.

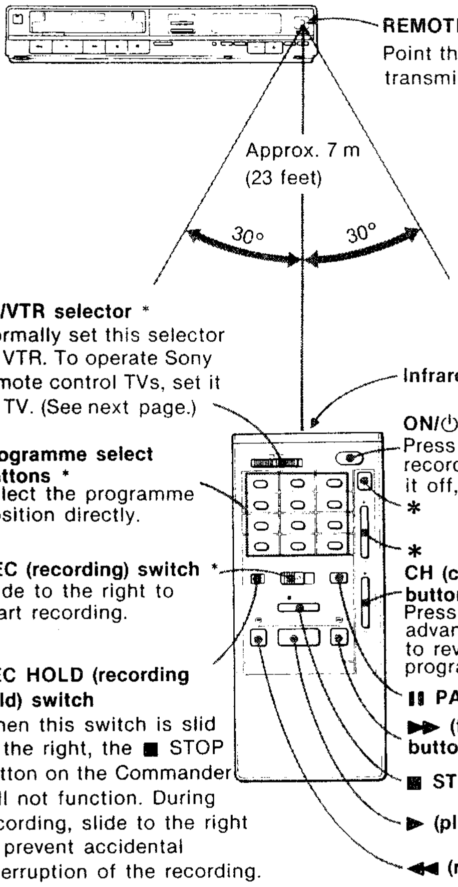
Battery life
In normal operation, batteries will last for about six months. If the range of the Remote Commander becomes noticeably short, replace the batteries with new ones. When the batteries are exhausted, the remote function indicator will not light when the buttons on the Commander are pressed.

If the Commander is not to be used for a long period of time, remove the batteries to avoid possible damage from battery leakage.

Notes

- There should be no obstacles between the Commander and the REMOTE SENSOR of the recorder.
- The shorter the distance between the Commander and the recorder, the wider the angle within which the recorder can be controlled.

OPERATION



REMOTE SENSOR
Point the infrared transmitter here.

TV/VTR selector *
Normally set this selector to VTR. To operate Sony remote control TVs, set it to TV. (See next page.)

Programme select buttons *
Select the programme position directly.

REC (recording) switch *
Slide to the right to start recording.

REC HOLD (recording hold) switch
When this switch is slid to the right, the ■ STOP button on the Commander will not function. During recording, slide to the right to prevent accidental interruption of the recording.

Infrared transmitter

ON/⏻ button *
Press to turn the recorder on. To turn it off, press again.

CH (channel) +/– scan button *
Press the + side to advance or the – side to reverse the programme numbers.

❚❚ PAUSE button

▶▶ (fast forward) button

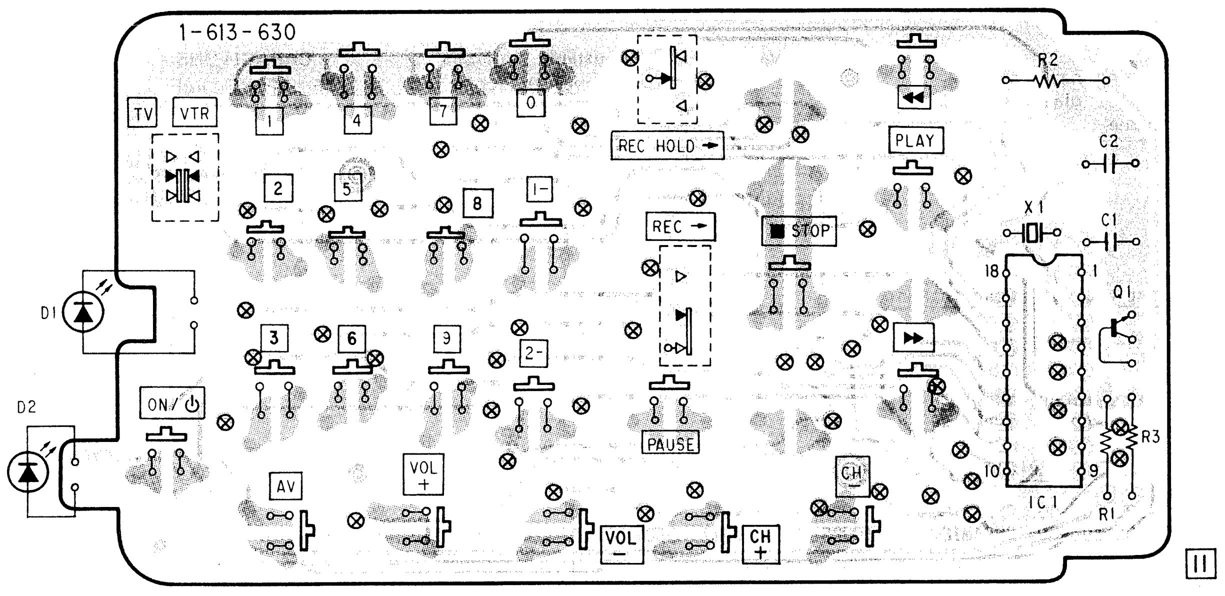
■ STOP button*

▶ (play) button

◀◀ (rewind) button*

2. PRINTED WIRING BOARD

TA BOARD

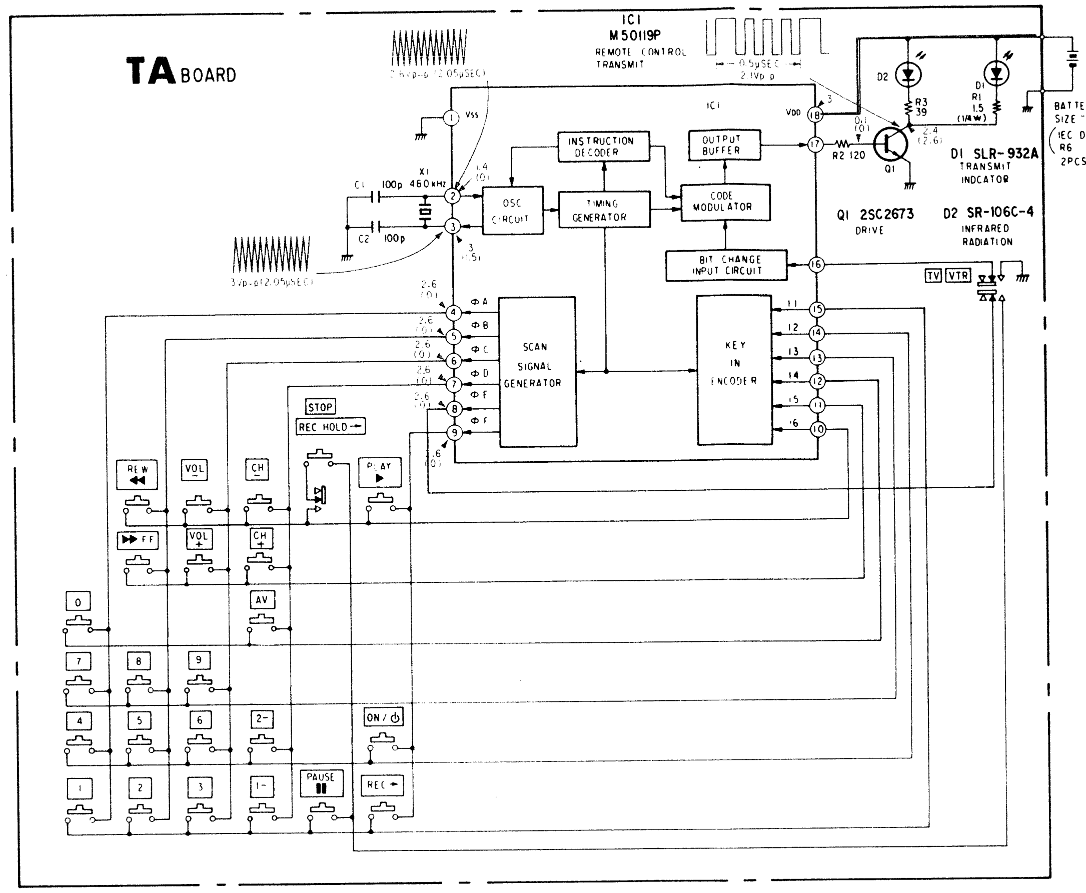

1-613-630
TV
VTR
1
4
7
0
REC HOLD
PLAY
R2
C2
2
5
8
1-
REC
STOP
X1
C1
18
1
Q1
D1
D2
3
6
3
2-
ON/⏻
PAUSE
R3
AV
VOL +
CH -
VOL -
CH +
10
9
IC1
R1
11

Note:

- ○— : indicates a lead wire mounted on the component side.
- ⊗ : Through hole.
- ▨ : Soldering side
- ▨ : carbon pattern
- ▨ : component side pattern
- ▨ : B + pattern

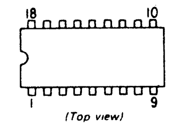
When indicating parts by reference number, please include the board name.

3. SCHEMATIC DIAGRAM

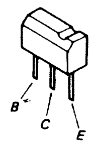

TA BOARD
IC1
M50119P
REMOTE CONTROL
TRANSMIT
2.6Vp-p (2.05μSEC)
0.5μSEC
2.1Vp-p
IC1
Vss
VDD
INSTRUCTION DECODER
OUTPUT BUFFER
OSC CIRCUIT
TIMING GENERATOR
CODE MODULATOR
BIT CHANGE INPUT CIRCUIT
SCAN SIGNAL GENERATOR
KEY IN ENCODER
C1 100p
C2 100p
X1 460kHz
3Vp-p (2.05μSEC)
ΦA
ΦB
ΦC
ΦD
ΦE
ΦF
D2
D1
R3 39
R1 1.5 (1/4W)
R2 120
Q1
BATTERY SIZE "AA" (IEC DESIGNATION R6) 2PCS 3V
D1 SLR-932A TRANSMIT INDCATOR
Q1 2SC2673 DRIVE
D2 SR-106C-4 INFRARED RADIATION
TV
VTR
STOP
REC HOLD
REW
VOL -
CH -
PLAY
FF
VOL +
CH +
AV
0
7
8
9
4
5
6
2-
ON/⏻
1
2
3
1-
PAUSE
REC

SEMICONDUCTORS

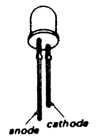
M50119P


18
10
1
9
(Top view)

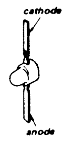
2SC2673



SLR-932A


anode
cathode

SR-106C


cathode
anode

Note:

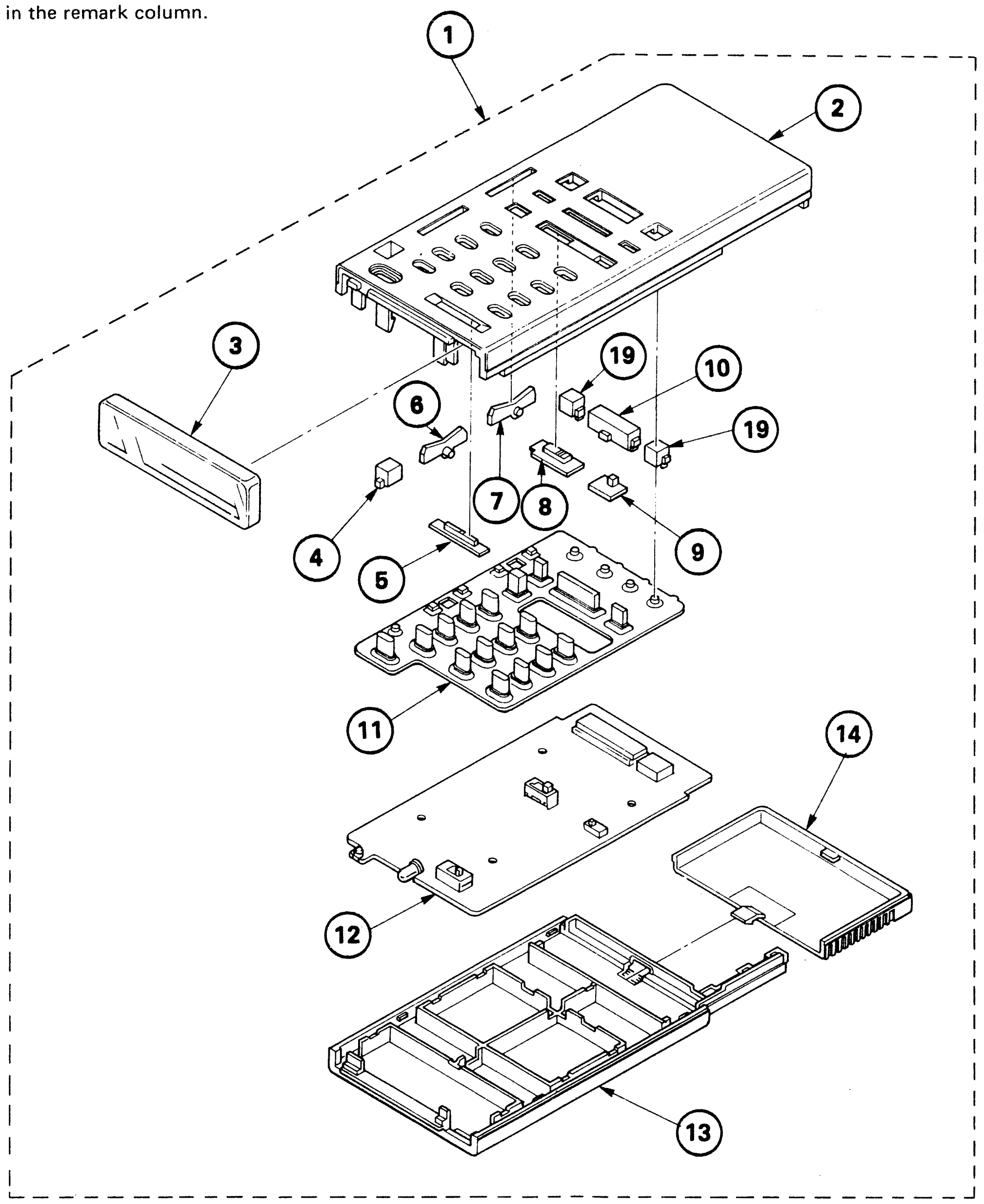
- All resistors are in ohms, 1/8W unless otherwise noted.
- All capacitors are in μF (p:pF) unless otherwise noted. 50V or less are not indicated except for electrolytic capacitors.
- ——— : B + bus.
- The voltage value is measured using a digital tester (10MΩ).

When indicating parts by reference number, please include the board name.

4. EXPLODED VIEW

NOTE:

- Itmes with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.



No.	ParT No.	Description	Remark
1	A-6765-648-A	COMMANDER ASSY RMT-234/GOLD	2-19
	A-6765-649-A	COMMANDER ASSY RMT-234/RED	2-19
	A-6765-650-A	COMMANDER ASSY RMT-234/GRAY	2-19
2	X-2394-103-1	CASE ASSY, UPPER (GOLD)	
	X-2394-104-1	CASE ASSY, UPPER (RED/GRAY)	
3	2-290-608-00	PLATE, FROSTEO	
4	2-394-101-01	KEY TOP (A)	
5	2-394-106-01	CAP (A)	
6	2-394-104-01	KNOB (A)	
7	2-394-105-01	KNOB (B)	
8	2-394-108-01	CAP (C)	
9	2-394-107-01	CAP (B)	
10	2-394-103-01	KEY TOP (C)	
11	2-394-111-11	SHEET, RUBBER, CONDUCTIVE	
12	*1-613-630-11	TA BOARD	
13	2-290-611-11	CASE, LOWER (RED/GRAY)	
	2-290-611-21	CASE, LOWER (GOLD)	
14	2-290-606-11	COVER, BATTERY (RED/GRAY)	
	2-290-606-21	COVER, BATTERY (GOLD)	
15	*2-394-112-01	LABEL	
16	4-350-925-00	TERMINAL (C), BATTERY	
17	2-290-601-00	TERMINAL (A), BATTERY	
18	2-290-602-00	TERMINAL (B), BATTERY	
19	2-394-102-01	KEY TOP (B)	

TA

5. ELECTRICAL PARTS LIST

NOTE:

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

No.	Part No.	Description				Remark
	*1-613-630-11	TA BOARD *********				
	2-290-601-00	TERMINAL (A), BATTERY				
	2-290-602-00	TERMINAL (B), BATTERY				
		CAPACITOR				
C1	1-102-106-00	CERAMIC	100PF	10%	50V	
C2	1-102-106-00	CERAMIC	100PF	10%	50V	
		DIODE				
D1	8-719-912-39	DIODE SLR-932A				
D2	8-719-100-06	DIODE SR106C				
		IC				
IC1	8-759-600-07	IC M50119P				
		TRANSISTOR				
Q1	8-729-967-32	TRANSISTOR 2SC2673				
		RESISTOR				
R1	1-246-405-25	CARBON	1.5	5%	1/4W	
R2	1-246-772-00	CARBON	120	5%	1/8W	
R3	1-246-766-00	CARBON	39	5%	1/8W	
		SWITCH				
S1	1-554-364-00	SWITCH, SLIDE				
S2	1-553-977-00	SWITCH, SLIDE				
S3	1-554-663-00	SWITCH, SLIDE				
		CRYSTAL				
X1	1-527-476-00	OSCILLATOR, CERAMIC				

****